Tivoli Storage Manager for UNIX Backup-Archive Clients Installation and User's Guide

Version 5 Release 1

GC32-0789-00

Tivoli Storage Manager for UNIX Backup-Archive Clients Installation and User's Guide

Version 5 Release 1

GC32-0789-00

Note
Before using this information and the product it supports, read the general information under "Notices" on page 357.

First Edition (March 2002)

This edition applies to version 5, release 1, modification 0 of Tivoli Storage Manager (5697-ISM, 5698-ISM), Tivoli Storage Manager, Enterprise Edition (5697-ISE, 5698-ISE) and to all subsequent releases and modifications until otherwise indicated in new editions.

Order publications through your Tivoli representative or the Tivoli branch office that serves your locality.

Tivoli welcomes your comments. You can send us comments about this book electronically at:

pubs@tivoli.com

Information sent grants Tivoli a nonexclusive right to use or distribute it in any way Tivoli believes appropriate, without incurring any obligation to you.

© Copyright International Business Machines Corporation 1993, 2002. All rights reserved.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Tables vii

Trademarks ix

About This Book. xi
Conventions Used in This Book xii
Reading Syntax Diagrams xii
Related Publications xv

Summary of Changes for Tivoli Storage Manager xvii
Technical Changes for Version 5.1 - April 2002 . . xvii

Chapter 1. Installing Tivoli Storage Manager 1
Root and Authorized User Tasks. 1
Migrating from Earlier Versions 1
Upgrade Path for Clients and Servers 1
Upgrading from ADSM Version 3.1 to a Later Client Version 2
ACL Support 2
Data Protection for NDMP Version 5.1 Requirements (Enterprise Edition only) 2
Processing Virtual Mount Points. 3
Additional Migration Information 3
Client Environment Requirements 3
AIX Client Environment 3
HP-UX Client Environment 4
Linux for X86 Client Environment 5
Linux for zSeries or S/390 Client Environment . . 6
OS/390 UNIX System Services Client Environment 6
Silicon Graphics IRIX Client Environment . . . 7
Solaris Client Environment 8
Pre-Installation Information 8
Online Startup Information 9
Installing the Backup-Archive Client 9
Installing the AIX Clients. 10
Installing the AIX 5L Client 12
Installing the HP-UX Clients. 14
Installing the Linux86 Client. 16
Installing the Linux390 Client 18
Installing the Silicon Graphics IRIX Clients . . . 20
Installing the Solaris Clients 21

Chapter 2. Configuring Tivoli Storage Manager 25
Creating and Modifying the Client Options File (Required Root User or Authorized User Task) . . 25
Creating a Default Client User Options File (Optional Root User or Authorized User Task). . 26
Registering Your Workstation with a Server (Required). 28
Using Closed Registration 28
Using Open Registration 28
Creating an Include-Exclude List (Optional) . . . 29
Using Include-Exclude Options. 30
Processing Include and Exclude Options. . . . 34
Setting Environment Variables 36
Setting Language Environment Variables . . . 36
Setting Font Defaults 38
Setting Processing Environment Variables . . . 38
Setting Bourne and Korn Shell Variables. . . . 39
Setting C Shell Variables 40
Setting API Environmental Variables 40

Chapter 3. Getting Started 41
Tivoli Storage Manager Client Authentication . . . 41
Starting a GUI Session. 42
Password and User ID. 42
Configuration Wizard 42
Starting a Command Line Session 42
Using Batch Mode 43
Using Interactive Mode 43
Starting: Additional Considerations 44
Starting a Web Client Session 44
Setting User Privileges. 46
Installing and Using the Web Client 46
Starting the Client Scheduler Automatically . . . 48
Changing Your Password. 48
Sorting File Lists. 49
Displaying Online Help 50
Ending a Session 50
Online Forum 50
Other Sources of Online Help 50
Contacting Customer Support 50

Chapter 4. Backing Up Files and Directories 53
Planning Your Backups 53
Do You Want to Back Up or Archive Files? 54
Using the AFS/DFS Backup Clients 54
Using an Include-Exclude Options List to Control Processing. 55
Encryption 55
Backing Up Files and Directories 55
Full Incremental Backup 56
Incremental-By-Date Backup. 57
Full Incremental versus Partial Incremental, Incremental-by-date Backups 57
Selective Backup. 58
Saving Access Permissions 58
Setting a Virtual Mount Point 58
Estimating Backup Processing Time 59
Backing Up Data Using the GUI 59
Backing up Data Using the Command Line. . . 60
Displaying Backup Processing Status 61
Performing an Image Backup 62
LAN-Free Data Movement 66
Backing Up NAS File Systems 66

© Copyright IBM Corp. 1993, 2002

Backup: Additional Considerations 66

Chapter 5. Restoring Files and Directories 73
No Query Restore 73
Standard Restore Process 74
No Query Restore Process 74
Do You Want to Restore an Active or Inactive Backup? 74
Performing a GUI Restore 75
Performing a Command Line Restore. 75
Performing Large Restore Operations. 76
Performing Point-in-Time Restores. 77
Restoring an Image. 78
Restoring Data from a Backup Set 79
Restoring an Entire or Partial Backup Set . . . 80
Restoring Backup Sets Using the GUI. 80
Restore: Additional Considerations 81
Authorizing Another User to Restore/Retrieve Your Files 81
Restoring or Retrieving Another User's Files . . 81
Restore or Retrieve Files to Another Workstation 82
Restoring a Disk In Case of Disk Loss 82
Deleting File Spaces 83

Chapter 6. Archiving and Retrieving Files. 85
Archiving Files 85
Estimating Backup Processing Time 85
Performing a GUI Archive 85
Performing a Command Line Archive 86
Deleting Archived Files 86
Archive: Advanced Considerations 87
Retrieving Archives. 88
Performing a GUI Retrieve 88
Performing a Command Line Retrieve 89
Understanding How Your Archives are Managed 89

Chapter 7. Automating Tasks 91
Specifying Scheduling Options 91
Return Codes from the Command Line Interface . . 91
Managing the Client Scheduler Using the Client Acceptor Daemon 93
Configuring the CAD to Manage the Scheduler 93
Starting the Client Scheduler 93
Displaying Information about Scheduled Work . . 94
Displaying Information about Completed Work . . 95
Scheduling Options for Commands 96
Enabling-Disabling Scheduled Commands 96

Chapter 8. Understanding Storage Management Policies 97
Using Policy Domains and Policy Sets 97
Using Management Classes and Copy Groups. . . 97
Displaying Information about Management Classes and Copy Groups 99
Copy Group Name 99
Copy Type. 99
Copy Frequency 99
Versions Data Exists 100
Versions Data Deleted 100
Retain Extra Versions. 100
Retain Only Version 100
Copy Serialization. 100
Copy Mode 101
Copy Destination 101
Retain Versions. 102
Selecting a Management Class for Files. 102
Assigning a Management Class to Files. 102
Overriding the Management Class for Archived Files 103
Selecting a Management Class for Directories. . . 103
Binding and Rebinding Management Classes to Files 104
Rebinding Backup Versions of Files 104
Using a Retention Grace Period 105

Chapter 9. Setting Processing Options 107
Creating and Modifying the Client System Options File. 107
Creating and Modifying the Client User Options File. 108
Communication Options. 109
TCP/IP Options 109
Shared Memory Options. 110
Server and Node Options 110
Server Options 111
Node Options 111
Backup and Archive Processing Options 112
Restore and Retrieve Processing Options 115
Scheduling Options 115
Format Options. 116
Command Processing Options. 116
Authorization Options 117
Error Processing Options 117
Transaction Processing Options 118
Web Client Options 118
Setting Options in a File. 119
Using Options with Commands 120
Entering Options with a Command 120
Client Options Reference 121
Afsbackupmntpnt 122
Archsymlinkasfile 123
Automount 124
Changingretries 125
Clusternode 126
Commmethod 127
Commrestartduration. 128
Commrestartinterval 129
Compressalways 130
Compression 131
Dateformat 133
Defaultserver 135
Dfsbackupmntpnt 136
Dfsinclexcl 137
Dirmc 138
Domain 139
Domain.image 142
Domain.nas 143
Editor 145

Enablelanfree 146
Encryptkey 148
Errorlogname 150
Errorlogretention 151
Exclude Options 152
Followsymbolic. 156
Groups 157
Guitreeviewafterbackup 158
Httpport 159
Httpsport. 160
Imagetype 161
Inclexcl 162
Include Options 163
Lanfreecommmethod 167
Lanfreeshmport 169
Lanfreetcpport 170
Largecommbuffers. 171
Localbackupset 172
Mailprog 173
Managedservices 174
Maxcmdretries 176
Memoryefficientbackup 177
Nasnodename 178
Nfstimeout 179
Nodename 180
Numberformat 182
Password. 184
Passwordaccess. 185
Passworddir. 187
Postschedulecmd/Postnschedulecmd 188
Preschedulecmd/Prenschedulecmd 190
Queryschedperiod. 192
Quiet 193
Replace 194
Resourceutilization 195
Retryperiod 197
Revokeremoteaccess 198
Schedcmddisabled. 199
Schedlogname 200
Schedlogretention 201
Schedmode 202
Scrolllines 204
Scrollprompt 205
Servername 206
Shmport 208
Snapshotcachesize 209
Subdir. 210
Tapeprompt 212
Tcpbuffsize 213
Tcpclientaddress 214
Tcpclientport 215
Tcpnodelay 216
Tcpport 217
Tcpserveraddress 218
Tcpwindowsize. 219
Timeformat 220
Txnbytelimit. 222
Users 223
Verbose 224
Virtualmountpoint. 225
Virtualnodename 227
Webports. 229

Chapter 10. Using Options with Commands 231
Entering Options with a Command 231
Command Line Options Reference 234
Archmc 236
Class 237
Deletefiles 238
Description 239
Detail 240
Dirsonly 241
Filelist. 242
Filesonly 244
Fromdate. 245
Fromnode 246
Fromowner 247
Fromtime. 248
Ifnewer 249
Inactive 250
Incrbydate 251
Incremental 252
Latest 253
Location 254
Mode 255
Monitor 256
Noprompt 257
Optfile 258
Pick 259
Pitdate 260
Pittime 261
Preservepath 262
Todate. 265
Totime. 266
Type 267
V2archive 268
Volinformation 269

Chapter 11. Using Commands 271
Starting and Ending a Client Command Session 273
Process Commands in Batch Mode 273
Process Commands in Interactive Mode . . . 273
Entering Client Commands. 274
Command Name 274
Options 274
Parameters 274
File Specification Syntax. 274
Maximum File Size for Operations 275
Remembering Previous Commands 276
Using Wildcard Characters 277
Entering Commands 277
Client Commands Reference 277
Archive 279
Backup Image 280
Backup NAS 283
Cancel Process 285
Cancel Restore 286
Delete Access 287
Delete Archive 288
Delete Filespace 289

Expire 291
Help 292
Incremental 293
Loop 298
Macro 299
Monitor Process 300
Query Access 301
Query Archive 302
Query Backup 303
Query Backupset 305
Query Filespace 306
Query Image 307
Query Inclexcl 308
Query Mgmtclass 309
Query Node 310
Query Restore 311
Query Schedule 312
Query Session 313
Restart Restore 314
Restore 315
Restore Backupset 318
Restore Image 321
Restore NAS 323
Retrieve 325
Schedule 327
Selective 329
Set Access 331
Set Password 333

Appendix A. The AFS and DFS File Backup Clients. 335
Contrasting AIX File Backup Clients. 335
Select Backup Functions 335
Set the Exclude.fs Option 336
Understanding Potential Backup Problems Caused by Mount Points 336
The Afsbackupmntpnt Option 336
The Dfsbackupmntpnt Option 337
Set the Virtualmountpoint and Domain Options 337
Use Another Method to Set These Options . . 338
Setting the ACLs and Kerberos Login 339
Setting the ACLs and DCE Login 339
Restoring AFS or DFS Files 339
Setting Processing Options 339

Appendix B. Configuring the Backup-Archive Client in an HACMP Takeover Environment 341
Installing the Backup-Archive Client. 341
Configuring the Backup-Archive Client To Process Local Nodes 342
Configuring Tivoli Storage Manager Backup-Archive Client To Process Cluster Disk Resources 342
Step 1: Register the Client to a Server 342
Step 2: Configure the Client System Options File 342
Step 3: Configure the Client User Options File 343
Defining the Client as an HACMP Application . . 343
Creating an HACMP Resource Group to Add a Client 344
Adding the Client to an HACMP Resource Group 345

Appendix C. Backing Up NAS File Systems Using NDMP. 347
Backing up NAS File Systems using the Web Client GUI 348
Performing a Command Line Backup 349
Restoring NAS File Systems 350

Appendix D. Web Client Secure Socket Layer 353
Configuring SSL Communications 353
Creating a Key Pair 353
Requesting a Certificate 353
Receiving the Certificate into the Key Ring . . 354
Configuring Web Client for SSL 354

Notices 357

Glossary 359

Index 369

Tables

1. Typographical Conventions xii
2. Tivoli Storage Manager Client Publications xv
3. Client Requirements 3
4. UNIX Client Installation Reference 9
5. Tivoli Storage Manager Server Quick Start Publications 23
6. Options for Excluding File Spaces and Directories 30
7. Options for Controlling Backup, Archive, and Image Processing 31
8. Options for Controlling Compression and Encryption Processing 32
9. Wildcard and Other Special Characters 33
10. Using Wildcard Characters with Include and Exclude Patterns 34
11. Preliminary Steps for Backing Up Files 53
12. Volume Device Type Support for an Image Backup 63
13. Symbolic Link Management Table for Backup and Restore 69
14. 73
15. Symbolic Link Management Table for Archive and Retrieve 87
16. Return Codes and Meanings 92
17. Default Values in the Standard Management Class 99
18. TCP/IP Options. 110
19. Shared Memory Communication Options 110
20. Server and Node Options 111
21. Backup and Archive Processing Options 112
22. Restore and Retrieve Processing Options 115
23. Scheduling Options 115
24. Format Options 116
25. Command Processing Options 116
26. Authorization Options 117
27. Error Processing Options. 117
28. Transaction Processing Options 118
29. Web Client Options 118
30. Encrypting or Decrypting Data 148
31. Client Command Options 231
32. Entering Commands 271
33. Commands 271
34. Maximum File Size for Backup, Restore, Archive, and Retrieve 275
35. Command Recall and Edit Functions 276
36. Wildcard Characters 277
37. Supported File Systems and ACL Support 294
38. Differences Between AIX File Backup Clients 335
39. Processing Options. 339
40. NAS Options and Commands 349
41. NAS Options and Commands 350

© Copyright IBM Corp. 1993, 2002

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

AIX
IBM
IBMLink
OS/390
RACF
RISC System/6000
RS/6000
Scalable POWERparallel
SP2
S/390
System/390
VisualAge
z/OS

UNIX is a registered trademark of The Open Group in the United States and other countries.

Microsoft, Windows, Windows NT, Windows 2000, Windows XP, Windows .NET, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Jaz and Zip are trademarks or registered trademarks of Iomega Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Tivoli is a trademark of International Business Machines Corporation. in the United States, or other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

© Copyright IBM Corp. 1993, 2002

About This Book

IBM Tivoli Storage Manager is a client-server licensed product that provides storage management services in a multi-platform computer environment. The backup-archive client program permits users to back up and archive files from their workstations or file servers to storage, and restore and retrieve backup versions and archived copies of files to their local file systems.

In addition to the backup-archive client, Tivoli Storage Manager includes the following components available on a variety of platforms:

- A *server program* that permits systems to perform either as a backup and archive server or migration server for distributed workstations and file servers. The server program also supplies hierarchical storage management (HSM) services.
- An *administrative client program* that you can access from a Web browser or the command line. The program permits an administrator to control and monitor server activities, define storage management policies for backup, archive and space management services, and set up schedules to perform those services at regular intervals.
- An *application program interface (API)* that permits you to enhance an existing application with storage management services. When an application is registered with a server as a client node, the application can back up, restore, archive, and retrieve objects from storage.
- A *Web backup-archive client* that permits an authorized administrator, help desk person, or end user to perform backup, restore, archive, and retrieve services using a Web browser on a remote machine.

Associated with Tivoli Storage Manager, but sold separately, is the *Tivoli Space Manager* client program which was previously a feature of ADSM known as *Hierarchical Storage Manager* (HSM). Tivoli Space Manager automatically migrates eligible files to storage to maintain specific levels of free space on local file systems and automatically recalls migrated files when they are accessed. It also permits users to migrate and recall specific files. This client program runs only on AIX and Solaris operating systems. For specific software requirements, see the README file that is shipped on the product installation media. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients* for more information.

The terms *hierarchical storage management* and *space management* have the same meaning throughout this publication.

This book explains how to install the Tivoli Storage Manager clients and how to perform initial setup tasks. For information about installation and levels of operating systems that are supported, refer to the installation chapter for your client. For information about environment variables, refer to the environment variables section for your client.

Tivoli Storage Manager tasks that can only be performed by authorized users and root users are identified by the phrases, **Authorized User** and **root user**. See "Root and Authorized User Tasks" on page 1 for more information about these tasks. An Authorized User is any user running with a real user ID of 0 (root) or a user who owns theTivoli Storage Manager executable and whose owner execution permission bit is set to **s**. In the following example, the user **tivoli** is an Authorized User while running `dsmc` since the `dsmc` owner execution permission bit is set to **s**:

© Copyright IBM Corp. 1993, 2002

```
-rwsr-xr-x  1  tivoli  dsmdev  2880479  Nov  5 13:42  dsmc*
```

This book provides information to help you set up and use the backup-archive client on your workstation. You should be familiar with your workstation, your operating system, and your basic system administration.

Tivoli Storage Manager books are translated into other languages. Contact your Tivoli Storage Manager representative for a list of available translations.

Conventions Used in This Book

This book uses the following typographical conventions:

Table 1. Typographical Conventions

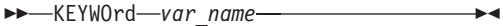
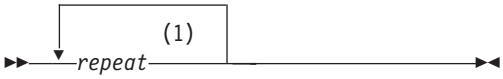
Example	Description
`dsmc.nlm`	A series of lowercase letters with an extension indicates Tivoli Storage Manager program file names.
archive	Boldface type indicates a command that you type at a workstation, such as a command you type on a command line.
dateformat	Boldface italic type indicates a Tivoli Storage Manager option. The bold type is used to introduce the option, or used in an example. All other times in the text it appears as regular type. Occasionally, file names are entered in boldface italic for emphasis.
filespec	Italicized type indicates either the name of a parameter, a new term, or a placeholder for information that you provide. Italics are also used for emphasis in the text.
`maxcmdretries`	Monospaced type represents fragments of a program or information as it would display on a screen.
plus sign (+)	A plus sign between two keys indicates you should press both keys at the same time.

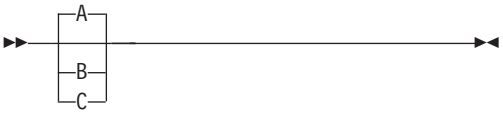
Reading Syntax Diagrams

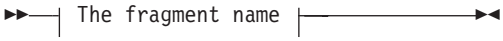
This section describes how to read the syntax diagrams used in this manual. To read a syntax diagram, follow the path of the line. Read from left to right, and top to bottom.

- The ▸▸── symbol indicates the beginning of a syntax diagram.
- The ──▸ symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ▸── symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The ──▸◂ symbol indicates the end of a syntax diagram.

Syntax items, such as a keyword or variable, can be:
- On the line (required element)
- Above the line (default element)
- Below the line (optional element).

Syntax Diagram Description	Example
Abbreviations: Uppercase letters denote the shortest acceptable truncation. If an item appears entirely in uppercase letters, it cannot be truncated. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	
Symbols: Enter these symbols exactly as they appear in the syntax diagram.	* Asterisk { } Braces : Colon , Comma = Equal Sign - Hyphen () Parentheses . Period Space
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	
Repetition: An arrow returning to the left means you can repeat the item. A character or space within the arrow means you must separate repeated items with that character or space. A footnote by the arrow references the number of times you can repeat the item.	  **Notes:** 1 Specify *repeat* as many as 5 times.

Syntax Diagram Description	Example
Required Choices: When two or more items are in a stack and one of them is on the line, you *must* specify one item. In this example, you *must* choose A, B, or C.	
Optional Choice: When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.	
Defaults: Defaults are above the line. The default is selected unless you override it. You can override the default by including an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.	
Repeatable Choices: A stack of items followed by an arrow returning to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	

Syntax Diagram Description	Example
Syntax Fragments: Some diagrams, because of their length, must fragment the syntax. The fragment name appears between vertical bars in the diagram. The expanded fragment appears between vertical bars in the diagram after a heading with the same fragment name.	 **The fragment name:**

Related Publications

Included here is a list of the publications that are referred to in this manual.

Table 2. Tivoli Storage Manager Client Publications

Publication Title	Order Number
Tivoli Storage Manager Messages	GC32-0767
Tivoli Storage Manager for Windows Backup-Archive Clients Installation and User's Guide	GC32-0788
Tivoli Storage Manager for NetWare Backup-Archive Client Installation and User's Guide	GC32-0786
Tivoli Storage Manager for Macintosh Backup-Archive Client Installation and User's Guide	GC32-0787
Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients	GC32-0794
Tivoli Storage Manager for AIX Managed System for SAN Storage Agent User's Guide	GC32-0771
Tivoli Storage Manager for Sun Solaris Managed System for SAN Storage Agent User's Guide	GC32-0781
Tivoli Storage Manager for HP-UX Managed System for SAN Storage Agent User's Guide	GC32-0727
Tivoli Storage Manager Using the Application Programming Interface	GC32-0793
Tivoli Storage Manager for AIX Administrator's Guide	GC32-0768
Tivoli Storage Manager for Sun Solaris Administrator's Guide	GC32-0778
Tivoli Storage Manager for Windows Administrator's Guide	GC32-0782
Tivoli Storage Manager for AIX Quick Start	GC32-0770
Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
Tivoli Storage Manager for OS/390 and z/OS Quick Start	GC32-0777
Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
Tivoli Storage Manager for Windows Quick Start	GC32-0784

The Tivoli Storage Manager publications are available on the following CD-ROM:

Tivoli Storage Manager Publications Version 5.1, SK3T-8176

Tivoli Storage Manager publications are available in softcopy at the following Web page:

`http://www.tivoli.com/support/public/Prodman/public_manuals/td/TD_PROD_LIST.html`

The IBM International Technical Support Center redbooks are available in softcopy on the IBM Redbooks Web site at the following Web page:

`http://www.redbooks.ibm.com`

You can order hardcopies of all our publications from the IBM Direct Publications Catalog Web site at the following Web page:

`http://www.elink.ibmlink.ibm.com/pbl/pbl`

Summary of Changes for Tivoli Storage Manager

This section summarizes changes made to the Tivoli Storage Manager product and this publication.

Technical Changes for Version 5.1 - April 2002

Following is a summary of changes since Tivoli Storage Manager Version 4.2:

Support for Cyclical Redundancy Checking (CRC)
Tivoli Storage Manager supports cyclical redundancy checking (CRC) to verify that data is not being corrupted in transfer during a backup or restore session.

Support for Processing Network Attached Storage (NAS) File System Images
Tivoli Storage Manager supports backup and restore of network attached storage (NAS) file system images to tape drives or libraries that are locally attached to NAS file servers. Data Protection for NDMP enables backup and restore support on the Tivoli Storage Manager Windows NT, 2000, XP, and Windows.NET, AIX, and Solaris servers for NAS file servers from Network Appliance. *Data Protection for NDMP is available only with IBM Tivoli Storage Manager Enterprise Edition*. See "Data Protection for NDMP Version 5.1 Requirements (Enterprise Edition only)" on page 2 for Data Protection for NDMP requirements. See Appendix C, "Backing Up NAS File Systems Using NDMP" on page 347 for information on how to back up and restore NAS file system images using the Web client and command line client.

Support for Logical Volume Backup as a Single Object (Image Backup) on Linux86 Client
The Linux86 client is enhanced to support a logical volume image backup of file systems and raw volumes. The Tivoli Storage Manager server does not track individual files in the file system image. File system images are tracked as individual objects and management class policy will be applied to the file system image as a whole. See "Performing an Image Backup" on page 62 for more information.

Support for Online Image Backup of File Systems and Raw Logical Volumes on Linux86 Client
The traditional *offline* image backup prevents access to the volume by other system applications during the operation. For Linux86 *only*: Tivoli Storage Manager performs an *online* image backup of file systems residing on a logical volume created by the Linux Logical Volume Manager, during which the volume is available to other system applications. See "Performing an Image Backup" on page 62 for more information.

LAN-Free Data Movement Support on HP-UX Client
Tivoli Storage Manager supports LAN-Free data movement in a storage area network (SAN) environment for the HP/UX client. LAN-Free data movement allows client data to move directly from the client to a SAN-attached storage device. Shifting the client data movement from the communications network to a SAN decreases the load on the server. This allows the server to support a greater number of simultaneous client connections. See "LAN-Free Data Movement" on page 66 for more information.

© Copyright IBM Corp. 1993, 2002

Enhanced Web Client Interface

The Web client interface is enhanced to support a JRE 1.3.1 Swing-enabled browser. The Web client facilitates the use of assistive devices for users with disabilities and contains improved keyboard navigation. The native look and feel of the platform running the browser is preserved. See "Starting a Web Client Session" on page 44 for more information.

Support for the z/OS file system on the OS/390 Client

Tivoli Storage Manager supports backup and restore of the z/OS file system on the OS/390 Client. See "Incremental" on page 293 for more information.

Support for the Sun Quick File System (QFS) 3.5.0 on the the Solaris Client

Tivoli Storage Manager supports backup, restore, archive and retrieve of the QFS file system on the Solaris client. QFS is a high-performance file system that enables file sharing in a SAN. It eliminates performance bottlenecks resulting from applications using very large file sizes. See "Incremental" on page 293 for more information.

Support for High Availability Cluster Multi Processing (HACMP) on AIX Client

Tivoli Storage Manager supports HACMP failover on AIX. This allows the client to continue operating in the event of an HACMP node failover and fallback.

Multiple Session No Query Restore

The backup-archive clients can now utilize multiple restore sessions for no query restore operations, increasing the speed of restores. This is similar to the multiple backup session support. It exploits the mount point available on the server. If data is backed up on multiple tapes, and if the server has multiple mount points available, then the restore starts a session for each tape, up to the number your administrator configures. See "Resourceutilization" on page 195 for more information.

Consistent Client Return Codes

Reliable, consistent, and documented return codes have been added to the command line client and the scheduler. This facilitates automation of client operations via user-written scripts. By using the **QUERY EVENT** command with the ***FORMAT***=*DETAILED* option, administrators can now distinguish between scheduled backups that completed successfully with no skipped files and scheduled backups that completed successfully with one or more skipped files. Also if you use the processing option**preschedulecmd** to run a command, and that command returns a non-zero return code, the scheduled event will not run. This ensures that scheduled events will not run if prerequisite commands do not complete successfully. See "Return Codes from the Command Line Interface" on page 91, "Preschedulecmd/Prenschedulecmd" on page 190, and "Postschedulecmd/Postnschedulecmd" on page 188 for more information.

Chapter 1. Installing Tivoli Storage Manager

The Tivoli Storage Manager backup-archive client helps you protect information on your workstation. Using Tivoli Storage Manager, you can maintain backup versions of your workstation files that you can restore if the original files are damaged or lost. You can also archive workstation files that you do not currently need, preserve them in their current state, and retrieve them when necessary.

You can access Tivoli Storage Manager backup and archive features:
- Locally through the native Graphical User Interface (GUI)
- Locally through the native client command line interface
- Remotely or locally through the Web client interface

Root and Authorized User Tasks

The phrases **root user** and **Authorized User** identify tasks that only root users and Authorized Users can perform. An **Authorized User** is any user running with a real user ID of 0 (root) or who owns the Tivoli Storage Manager executable with the owner execution permission bit set to **s**.

As a **root user**, you can perform the following tasks:
- Install the backup-archive client.
- Back up or archive any file on a user's system.
- Restore or retrieve any file in storage.
- Back up, restore or query an image.
- Restore or query a backup set.

File access permissions do not restrict a root user.

As a **root user** *or* an **Authorized User**, you can perform the following tasks:
- Set or change the password for your workstation, if a password is required.
- Register your workstation with a server.
- Use the scheduler to perform scheduled tasks for your client node.
- Back up, archive, restore, or retrieve all eligible files in all locally mounted file systems on your workstation as permitted by your operating system file access permissions.
- Grant users access to specific files in storage.
- Delete backup and archive file systems from storage. (The node must have been granted backup or archive delete authority by a server administrator.)

Migrating from Earlier Versions

Upgrade Path for Clients and Servers

As part of a migration plan from Tivoli Storage Manager version 4.2 to Tivoli Storage Manager version 5.1, Tivoli Storage Manager clients and servers may be upgraded at different times. To help ensure that you can continue your backup and archive activities during the migration, note the following:

- A Tivoli Storage Manager version 4.2 client can perform backup, restore, archive, and retrieve functions to a Tivoli Storage Manager version 5.1 server.
- A Tivoli Storage Manager version 5.1 client can perform backup, restore, archive, retrieve, and query functions to a Tivoli Storage Manager version 4.2 server.

© Copyright IBM Corp. 1993, 2002

- A Tivoli Storage Manager version 4.2 HSM client can perform migrate and recall functions to a Tivoli Storage Manager Version 5.1 server.
- A Tivoli Storage Manager version 5.1 HSM client can perform migrate and recall functions to a Tivoli Storage Manager version 4.2 server.
- Data that has been backed up, archived, or migrated from a Tivoli Storage Manager version 5.1 client to any Tivoli Storage Manager server cannot be restored, retrieved, or recalled using a Tivoli Storage Manager version 4.2.1 or lower level client.
- All command line administrative clients can administer Tivoli Storage Manager version 4.2 and version 5.1 servers.
- Storage agents and servers must be at the same level of code. When the server is upgraded, the storage agents which are using that particular server must be upgraded as well.

Upgrading from ADSM Version 3.1 to a Later Client Version

For AIX: When upgrading from an ADSM version 3.1 client to a later Tivoli Storage Manager client version, you may want to consider the following:

- Tivoli Storage Manager does not move or copy the dsmsched.log and dsmerror.log files from the old installation directory to the new installation directory.
- The ADSM version 3.1 installation directory, `/usr/lpp/adsm/bin`, is not removed.
- The ADSM version 3.1 publications are not removed.
- Tivoli Storage Manager does not remove ADSM version 3.1 filesets such as `adsm.client.aix42.admin lpp`.

ACL Support

See "Supported File Systems and ACL Support" on page 294 for a complete list of file systems for which Tivoli Storage Manager provides ACL support.

Data Protection for NDMP Version 5.1 Requirements (Enterprise Edition only)

Tivoli Storage Manager Enterprise Edition supports backup and restore of network attached storage (NAS) file system images to tape drives or libraries that are locally attached to NAS file servers. Data Protection for NDMP enables backup and restore support on the Tivoli Storage Manager client for Windows NT, 2000, XP, and Windows.NET servers for NAS file servers from Network Appliance. *Data Protection for NDMP is available only on IBM Tivoli Storage Manager Enterprise Edition*.

Data Protection for NDMP requires the following hardware and software:

- Tivoli Storage Manager Version 5.1 server on AIX, Sun Solaris, and HP-UX.
- Tivoli Storage Manager Version 5.1 client on Sun Solaris (32-bit and 64-bit) and AIX (32-bit and 64-bit).
- Network Appliance NAS file server. For supported models and operating systems, refer to:

  `www.tivoli.com/storage`
- Tape drive and tape library. For supported combinations, refer to:

  `www.tivoli.com/storage`

See Appendix C, "Backing Up NAS File Systems Using NDMP" on page 347 for further information, including how to back up and restore NAS file system images using the Web client and command line client.

Processing Virtual Mount Points

Use the AFS/DFS versions of the backup client executables to process virtual mount points for AFS/DFS file systems. Version 3 and higher backup-archive clients do not process virtual mount points specified for AFS/DFS file systems. See Appendix A, "The AFS and DFS File Backup Clients" on page 335 for more information.

Additional Migration Information

When you install the Web client, you must install the backup-archive client for the language you want to use.

A command line administrative client is available on all client platforms. The primary intended interface to the server is the Web administrative interface and requires a Web browser. The Web administrative interface is packaged and installed with the server.

Client Environment Requirements

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the UNIX clients. Table 3 lists the location of the environment prerequisites for each supported platform.

Attention

For current information concerning the client environment prerequisites for all Tivoli Storage Manager supported client platforms refer to the `README` file that is shipped on the product installation media.

Table 3. Client Requirements

Operating System	Page
AIX Client Environment	3
HP-UX Client Environment	4
Linux for X86 Client Environment	5
Linux for zSeries or S/390 Client Environment	6
OS/390 UNIX System Services Client Environment	6
Silicon Graphics IRIX Client Environment	7
Solaris Client Environment	8

AIX Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the AIX platform.

Client Components

- Backup-archive client (command-line and GUI)
- Administrative client (command-line)
- Web backup-archive client
- Tivoli Storage Manager API (32-bit and 64-bit)
- AIX 4.3 only:
  - AFS/DFS client
  - X/Open API

Hardware Requirements

- AIX 4.3: A RISC System/6000 or pSeries
- AIX 5L: A Power PC machine (64-bit CHRP-compliant)
- Disk space: see the README file that is shipped on the product installation media
- Memory: 64 MB

This includes any applications running on IBM's Scalable POWERparallel Systems 2 (SP2).

Software Requirements

- AIX 4.3.3
- AIX 5L for POWER V5.1 (32-bit and 64-bit) with JFS2 file system support
- AIX 4.3.3 and AFS 3.6 for Tivoli Storage Manager AIX AFS client
- AIX 4.3.3 and DCE/DFS 3.1 for Tivoli Storage Manager AIX DFS client

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with supported AIX platforms)	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT
Shared Memory	TCP/IP (Standard with supported AIX platforms)	AIX

Additional Software Requirements

The backup-archive client GUI requires:

- X Window System X11R6
- Motif 1.2 or 2.0
- Common Desktop Environment (CDE)

HP-UX Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the HP-UX platform.

Client Components

- Backup-archive client (command-line and GUI)
- Administrative client (command line)
- Tivoli Storage Manager API (32-bit and 64-bit)
- X/Open API
- Web backup-archive client

Hardware Requirements

- An HP 9000 Series 700 or 800 workstation
- Disk space: see the README file that is shipped on the product installation media
- Memory: 64 MB

Software Requirements

- HP-UX 11.0, HP-UX 11i

Communications Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with HP-UX)	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT
Shared Memory	TCP/IP (Standard with HP-UX)	HP-UX

Additional Software Requirements

The backup-archive client GUI requires:

- X Window System X11R6
- Motif 2.0
- Common Desktop Environment (CDE)
- CDE online help facility libraries: libDtHelp.sl and libDtSvc.sl, typically located in /usr/dt/lib.

Linux for X86 Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Linux for X86 (Linux86) platform.

Client Components

- Backup-archive client (command-line and GUI)
- Administrative client (command line)
- Tivoli Storage Manager API
- Web backup-archive client

Hardware Requirements

- X86 based PC architecture (for example Pentium) or higher
- Disk space: see the README file that is shipped on the product installation media
- Memory: 64 MB

Software Requirements

The backup-archive client requires the following software to run:

- Linux kernel 2.4.0 or higher
- glibc 2.2 or higher
- libstdc++2.9.0 or higher
- X Window System X11R6 (for end user GUI only)
- RPM 3.0.0 or higher, 4.0

The following Linux distributions meet these requirements:

- SUSE 7.0, 7.1, 7.2, and 7.3
- Red Hat 7.1, 7.2
- Turbo Linux 7.0

Notes:

1. The client was certified by Tivoli for these distributions. Please verify for other distributions that the software requirements listed above are fulfilled.
2. Please note that X Windows System X11R6 is a requirement to install the client. If it is not installed and you do not plan to use the end user GUI, you have to add the --nodeps option of rpm to disable the check for requirements.

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with Linux)	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT

Linux for zSeries or S/390 Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Linux for zSeries or S/390 (Linux390) platform.

Client Components

- Backup-archive client (command-line)
- Administrative client (command line)
- Tivoli Storage Manager API
- Web backup-archive client

Hardware Requirements

- A 9672 G5 or G6, Multiprise 3000, or zSeries 900 (32 bit mode)
- Disk space: see the README file that is shipped on the product installation media.
- Memory: 64 MB

Software Requirements

The backup-archive client requires the following software to run:

- Linux kernel 2.2.16 or higher
- glibc 2.1.2 or higher
- libstdc++2.9.0 or higher
- RPM 3.0.4 or higher

The Linux distributions that fulfill these requirements include:

- SUSE 7.0

Note: The Linux z/series and S/390 was certified by Tivoli for this distribution. Please verify for other distributions that the software requirements listed above are fulfilled.

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with Linux)	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT

OS/390 UNIX System Services Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the OS/390 UNIX System Services platform.

Client Components
- Backup-archive client (command-line)
- Administrative client (command-line)
- Tivoli Storage Manager API
- Web backup-archive client

Hardware Requirements
- Any System/390
- Disk space: see the README file that is shipped on the product installation media.

Software Requirements
OS/390 V2R8, V2R9, or V2R10 with SMP/E

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	IBM TCP/IP	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT

Silicon Graphics IRIX Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Silicon Graphics IRIX platform.

Client Components
- Backup-archive client (command-line and GUI)
- Administrative client (command-line)
- Tivoli Storage Manager API
- Web backup-archive client

Hardware Requirments
- A SGI workstation with MIPS processor IP19 (R4K) or higher
- Disk space: see the README file that is shipped on the product installation media.
- Memory: 64 MB

Software Requirements
- IRIX UNIX 6.5 with EFS or XFS File systems

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with IRIX UNIX).	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT

Additional Software Requirements
The backup-archive client GUI requires:
- X Window System X11R6
- Motif 1.2 or 2.0

Solaris Client Environment

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Sun Solaris platform.

Client Components

- Backup-archive client (command-line and GUI)
- Administrative client (command-line)
- Tivoli Storage Manager API (32-bit and 64-bit)
- X/Open API
- Web backup-archive client

Hardware Requirements

- A SPARCstation based on sun4u architecture
- Disk space: see the README file that is shipped on the product installation media
- Memory: 64 MB

Software Requirements

- Sun Solaris 2.6, 7, or 8 (32-bit); Sun Solaris 7 or 8 (64-bit)

Communication Methods

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	TCP/IP (Standard with Solaris)	AIX, HP-UX, VM, z/OS, OS/390, Solaris, Windows NT
Shared Memory	TCP/IP (Standard with Solaris)	Solaris

Additional Software Requirements

The backup-archive client GUI requires:

- X Window System X11R6
- Motif 2.0
- CDE online help facility libraries: libDtHelp.sl and libDtSvc.sl, typically located in /usr/dt/lib

Pre-Installation Information

The client images, except the OS/390 UNIX client, are contained on Tivoli Storage Manager product CD-ROMs for the UNIX clients and the desktop clients. The images reside in the `tsmcli/'platform'/` directory structure, where `'platform'` is one of the following platform designations: **hp11, linux86, linux390, sgi, solaris**. The AIX and AIX 5L client images are in the `/usr/sys/inst.images` directory. See the following publications for information about available OS/390 UNIX client installation media:

- *Program Directory for Tivoli Storage Manager, S/390 Edition Backup-Archive Client* (5698-TSM, order number GI10-4541)
- *Program Directory for Tivoli Storage Manager, S/390 Backup-Archive Client* (5697-TS9), order number GI10-4542
- *Program Directory for Tivoli Storage Manager, S/390 API* (5698-TSM), order number GI10-4539
- *Program Directory for Tivoli Storage Manager, S/390 API* (5697-TS9), order number GI10-4540

You can install the clients using any of the following methods:

- Install directly from the CD-ROM.
- Create client images to install.
- Transfer installable files from the CD-ROM to a target workstation.

Online Startup Information

You can display online startup information, product manuals, and readmes. On a Web browser:

1. Click **File** and then click **Open File**.
2. Select the CD-ROM drive.
3. Select the **START.HTM** file.

Installing the Backup-Archive Client

This chapter provides instructions to install and set up Tivoli Storage Manager UNIX clients.

Note: A root user *must* install Tivoli Storage Manager on a UNIX workstation.

After installation completes, see Chapter 2, "Configuring Tivoli Storage Manager" on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Table 4 lists the supported UNIX clients and the location of the installation instructions for each client.

Table 4. UNIX Client Installation Reference

Installation Instructions	Page
Installing the AIX Clients	10
Installing the AIX 5L Client	12
Installing the HP-UX Clients	14
Installing the Linux86 Client	16
Installing the Linux390 Client	18
For information on Installing the OS/390 UNIX System Services Client, see the following publications: • *Program Directory for Tivoli Storage Manager, S/390 Edition Backup-Archive Client* (5698-TSM), order number GI10-4541 • *Program Directory for Tivoli Storage Manager, S/390 Backup-Archive Client* (5697-TS9), order number GI10-4542 • *Program Directory for Tivoli Storage Manager, S/390 API* (5698-TSM), order number GI10-4539 • *Program Directory for Tivoli Storage Manager, S/390 API* (5697-TS9), order number GI10-4540	
Installing the Silicon Graphics IRIX Clients	20
Installing the Solaris Clients	21

Installing the AIX Clients

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media. For current information concerning supported platforms, and for the latest documentation, refer to the product Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following packages are available on the installation media in the `/usr/sys/inst.images` directory:

tivoli.tsm.client.ba.aix43.32bit
Installs the backup-archive client files (command-line and GUI), administrative client (command-line), and HSM (4.3.3 only) into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.image.aix43.32bit
Installs the image backup component into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.web.aix43.32bit
Installs the Web client into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.nas.aix43.32bit
Installs the NAS backup component into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.books
Installs the PDF and HTML book files into the `/usr/tivoli/tsm/client/books` directory.

tivoli.tsm.client.ba.msg.*lang*
Installs NL messages for the Backup-Archive client. Where *lang* is the language identifier, for example Ja_JP for Japanese. American English messages are already included in the backup-archive client code. The default installation directory is `/usr/tivoli/tsm/client/ba/bin/`*lang*, where *lang* is the language identifier.

tivoli.tsm.client.api.aix43.32bit
Installs the 32 bit API into the `/usr/tivoli/tsm/client/api/bin` directory.

tivoli.tsm.client.api.aix43.64bit
Installs the 64 bit API into the `/usr/tivoli/tsm/client/api/bin64` directory.

tivoli.tsm.client.api.msg.*lang*
Installs the NL messages for API. Where *lang* is the language identifier, for example Ja_JP for Japanese. American English messages are already included in the API client code. The default installation directory is `/usr/tivoli/tsm/client/api/bin/`*lang*, where *lang* is the language identifier.

tivoli.tsm.client.afs.aix43.32bit
Installs the AFS backup-archive client files (command-line and GUI), into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.dfs.aix43.32bit
Installs the DFS backup-archive client files (command-line and GUI), into the `/usr/tivoli/tsm/client/ba/bin` directory.

This installation procedure is designed to install directly from the CD-ROM from a local or remote-mounted CD-ROM drive.

If you are installing from a Tivoli Storage Manager image run, the following command from the directory to which you copied the Tivoli Storage Manager image:

```
/usr/sbin/inutoc /usr/sys/inst.images
```

A **.toc** file is created in that directory.

Note: Do not put any user created files into `/usr/tivoli/tsm/client/ba/bin`, the base directory into which the product is installed. Any and all files in this directory might be deleted during installation processing. Include-exclude files, dsm.opt, and dsm.sys files should not reside in this directory.

When upgrading from ADSM version 3.1 to a later client version you should consider the following:

- The dsmsched.log and dsmerror.log files are not moved or copied from the old installation directory to the new installation directory.
- The ADSM version 3.1 installation directory, `/usr/lpp/adsm/bin`, is not removed.
- The ADSM version 3.1 publications are not removed.
- ADSM version 3.1 filesets such as adsm.client.aix42.admin lpp are not removed.

To install Tivoli Storage Manager from the CD-ROM:

1. Log in as the root user, insert the CD-ROM into the CD-ROM drive device, and mount the CD-ROM drive.
2. From the AIX command line, type **smitty install** and press Enter.
3. Select **Install and Update Software** and press Enter.
4. Select **Install and Update From ALL Available Software** and press Enter.
5. At the **INPUT device/directory for software** prompt, press the F4 key and select the CD-ROM device containing the installation CD-ROM or specify the directory containing the installation images, and press Enter.
6. At the **SOFTWARE to install** prompt, press the F4 key. Select the Tivoli Storage Manager filesets you want to install and press Enter.
7. Select the options you want and press Enter to begin the installation.

The Tivoli Storage Manager files are installed in the `/usr/tivoli/tsm/client/ba/bin` directory. If you move the Tivoli Storage Manager files to another directory, you must perform the following steps:

1. Make sure the permissions of the installed files have not changed.
2. Update the symbolic links for the installed files in the `/usr/bin` directory and in the directory that contains symbolic links for each language package you install (for example, `/usr/lib/nls/msg/en_US`).
3. Ensure that every user of Tivoli Storage Manager sets the DSM_DIR environment variable to the newly installed directory.

See Appendix A, “The AFS and DFS File Backup Clients” on page 335 for special considerations when installing and configuring the TSM client for AFS/DFS on an AIX workstation.

After installation completes, see Chapter 2, “Configuring Tivoli Storage Manager” on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the AIX 5L Client

Attention

For current installation and configuration information for the Tivoli Storage Manager product, refer to the `README` file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following packages are available on the installation media in the `/usr/sys/inst.images` directory:

tivoli.tsm.client.ba.aix51.64bit.base
Installs the backup-archive client files (command-line and GUI), administrative client (command-line) into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.ba.aix51.64bit.common
Installs the Tivoli Storage Manager common files into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.ba.aix51.64bit.image
Installs the image backup component into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.ba.aix51.64bit.web
Installs the Web client into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.ba.aix51.64bit.nas
Installs the NAS backup component into the `/usr/tivoli/tsm/client/ba/bin` directory.

tivoli.tsm.client.books
Installs the PDF and HTML book files into the `/usr/tivoli/tsm/client/books` directory.

tivoli.tsm.client.ba.msg.*lang*
Installs NL messages for the Backup-Archive client. Where *lang* is the language identifier, for example Ja_JP for Japanese. American English messages are already included in the backup-archive client code. The default installation directory is `/usr/tivoli/tsm/client/ba/bin/`*lang*, where *lang* is the language identifier.

tivoli.tsm.client.ba.aix51.64bit.api
Installs the 64 bit API into the `/usr/tivoli/tsm/client/api/bin64` directory.

tivoli.tsm.client.api.msg.*lang*
Installs the NL messages for API. Where *lang* is the language identifier, for example Ja_JP for Japanese. American English messages are already included in the API client code. The default installation directory is `/usr/tivoli/tsm/client/api/bin/`*lang*, where *lang* is the language identifier.

Note: The AIX 5L client does not support the AFS/DFS backup-archive client.

This installation procedure is designed to install directly from the CD-ROM from a local or remote-mounted CD-ROM drive.

If you are installing from a Tivoli Storage Manager image run, the following command from the directory to which you copied the Tivoli Storage Manager image:

```
/usr/sbin/inutoc /usr/sys/inst.images
```

A **.toc** file is created in that directory.

Attention: Do not put any user created files into `/usr/tivoli/tsm/client/ba/bin`, the base directory into which the product is installed. Any and all files in this directory might be deleted during installation processing. Include-exclude files, dsm.opt, and dsm.sys files should not reside in this directory.

When upgrading from ADSM version 3.1 to a later client version you should consider the following:

- The dsmsched.log and dsmerror.log files are not moved or copied from the old installation directory to the new installation directory.
- The ADSM version 3.1 installation directory, `/usr/lpp/adsm/bin`, is not removed.
- The ADSM version 3.1 publications are not removed.
- ADSM version 3.1 filesets such as adsm.client.aix42.admin lpp are not removed.

To install Tivoli Storage Manager from the CD-ROM:

1. Log in as the root user, insert the CD-ROM into the CD-ROM drive device, and mount the CD-ROM drive.
2. From the AIX command line, type **smitty install** and press Enter.
3. Select **Install and Update Software** and press Enter.
4. Select **Install and Update From ALL Available Software** and press Enter.
5. At the **INPUT device/directory for software** prompt, press the F4 key and select the CD-ROM device containing the installation CD-ROM or specify the directory containing the installation images, and press Enter.
6. At the **SOFTWARE to install** prompt, press the F4 key. Select the Tivoli Storage Manager filesets you want to install and press Enter.
7. Select the options you want and press Enter to begin the installation.

The Tivoli Storage Manager files are installed in the `/usr/tivoli/tsm/client/ba/bin` directory. If you move the Tivoli Storage Manager files to another directory, you must perform the following steps:

1. Make sure the permissions of the installed files have not changed.
2. Update the symbolic links for the installed files in the `/usr/bin` directory and in the directory that contains symbolic links for each language package you install (for example, `/usr/lib/nls/msg/en_US`).
3. Ensure that every user of Tivoli Storage Manager sets the DSM_DIR environment variable to the newly installed directory.

After installation completes, see Chapter 2, “Configuring Tivoli Storage Manager” on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the HP-UX Clients

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the README file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following source packages are available on the installation media:

tsmcli/hp11/TIVsmC

In this package the software selection name used by swlist for the top level product name is TIVsm. The components under TIVsm are TIVsm.CLIENT, TIVsm.CLIENT_API, and TIVsm.CLIENT_DOC.

TIVsm.CLIENT

Contains the backup-archive client (command-line and GUI), administrative client (command-line), and the Web client.

TIVsm.CLIENT_API

Contains the 32-bit API.

TIVsm.CLIENT_DOC

Contains the documentation.

tsmcli/hp11/TIVsmCapi64

In this package the software selection name used by swlist for the top level product name is TIVsm64. The component under TIVsm64 is TIVsm.CLIENT_API.

TIVsm.CLIENT_API

Contains the 64-bit API

tsmcli/hp11/TIVsmCapi

In this package the software selection name used by swlist for the top level product name is TIVsm. The component under TIVsm is TIVsm.CLIENT_API.

TIVsm.CLIENT_API

Contains the 32-bit API

To remove previous ADSM client versions, log in as the root user and enter the following command:

```
/usr/sbin/swremove -x mount_all_filesystems=false -v IBMADSM
```

To remove previous Tivoli Storage Manager client versions, log in as the root user and enter the following command:

```
/usr/sbin/swremove -x mount_all_filesystems=false -v TIVsm.CLIENT
```

Note: If you also installed the CLIENT_API and CLIENT_DOC filesets, execute the following command to remove them:

```
/usr/sbin/swremove -x mount_all_filesystems=false -v
TIVsm.CLIENT_API TIVsm.CLIENT_DOC
```

To install from the CD-ROM, Log in as the root user, mount the CDROM to /cdrom, change directory to tsmcli/hp11. If you downloaded from ftp, go to the directory where the installable image is located. Enter the following command:

```
swinstall -x mount_all_filesystems=false -v -s 'pwd'/
TIVsmC TIVsm
```

Note: replace '*pwd*' with the absolute name of the current directory.

To install only the API or the documentation, omit the last `TIVsm` from the command above, and mark only the fileset for installation in the swinstall user interface you want to install. The Client needs the API for Raw Logical Volume backup. Therefore, if you mark CLIENT for installation the API must also be installed.

During installation:

- The Tivoli Storage Manager backup-archive and Web client files are installed in the `/opt/tivoli/tsm/client/ba/bin` directory.
- The administrative client (dsmadmc) is installed in `/opt/tivoli/tsm/client/admin/bin`.
- The Tivoli Storage Manager API files are installed in the `/opt/tivoli/tsm/client/api/bin` directory.
- The documentation files are installed in `/opt/tivoli/tsm/client/books`.

After installation completes, see Chapter 2, "Configuring Tivoli Storage Manager" on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the Linux86 Client

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following installation options are available in uncompressed packages on the CD:

`tsmcli/linux86/TIVsm-BA`
Installs the backup-archive client (command-line and GUI), administrative client (command-line), and the Web client.

`tsmcli/linux86/TIVsm-API`
Installs the API.

If there is a previous unsupported Linux client installed, you must uninstall the unsupported Linux client.

To delete previously installed Tivoli Storage Manager client packages, log in as root and enter:

```
   rpm -e TIVsm-BA
and for the API:
   rpm -e TIVsm-API
```

Note: The package version number is not needed for uninstall.

Use the following procedure to install the Tivoli Storage Manager clients:

1. Log in as the root user and mount the CD-ROM to `/cdrom`.
2. Enter the following directory path where the installation packages reside on the CD:

   ```
   /cdrom/tsmcli/linux86
   ```

3. Enter the following command to install the backup-archive client (command-line and GUI), the administrative client (command-line), and the Web client:

   ```
   rpm -i TIVsm-BA.i386.rpm
   ```

   Note: To circumvent the dependence check use the --nodeps option. You must check the dependencies manually.

4. Enter the following command to install the API:

   ```
   rpm -i TIVsm-API.i386.rpm
   ```

   Note: To circumvent the dependence check use the --nodeps option. You must check the dependencies manually.

During installation :

- The Tivoli Storage Manager backup-archive client and Web client files are installed in the `/opt/tivoli/tsm/client/ba/bin` directory.
- The TSM administrative client (command line) is installed in the `/opt/tivoli/tsm/client/admin/bin` directory.
- The Tivoli Storage Manager API files are installed in the `/opt/tivoli/tsm/client/api/bin` directory.

- The TSM documentation files are installed in the /opt/tivoli/tsm/client/books/html and `/opt/tivoli/tsm/client/books/pdf` directories.

After installation completes, see Chapter 2, "Configuring Tivoli Storage Manager" on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the Linux390 Client

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following installation options are available in uncompressed packages on the CD:

`tsmcli/linux390/TIVsm-BA`
Installs the backup-archive client (command-line and GUI), administrative client (command-line), and the Web client.

`tsmcli/linux390/TIVsm-API`
Installs the API.

If there is a previous unsupported Linux client installed, you must uninstall the unsupported Linux client.

To delete previously installed client packages, log in as root and enter:

```
   rpm -e TIVsm-BA
and for the API:
   rpm -e TIVsm-API
```

Note: The package version number is not needed for uninstall.

Use this installation procedure to install directly from the CD-ROM from a local or remote-mounted CD-ROM drive:

1. Log in as the root user and mount the CD-ROM to `/cdrom`.
2. Enter the following directory path where the installation packages reside on the CD:

   ```
   /cdrom/tsmcli/linux390
   ```

3. Enter the following command to install the backup-archive client (command-line), the administrative client (command-line), and the Web client:

   ```
   rpm -i TIVsm-BA.s390.rpm
   ```

   Note: If all required *libs* are not installed with rpm please enter the following command:

   ```
   rpm -i --nodeps TIVsm-BA.s390.rpm
   ```

4. Enter the following command to install the API:

   ```
   rpm -i TIVsm-API.s390.rpm
   ```

   Note: If all required libs are not installed with rpm please enter the following command:

   ```
   rpm -i --nodeps TIVsm-API.s390.rpm
   ```

During installation :

- The Tivoli Storage Manager backup-archive client and Web client files are installed in the `/opt/tivoli/tsm/client/ba/bin` directory.
- The TSM administrative client (command line) is installed in the `/opt/tivoli/tsm/client/admin/bin` directory.

- The Tivoli Storage Manager API files are installed in the `/opt/tivoli/tsm/client/api/bin` directory.
- The TSM documentation files are installed in the /opt/tivoli/tsm/client/books/html and `/opt/tivoli/tsm/client/books/pdf` directories.

After installation completes, see Chapter 2, "Configuring Tivoli Storage Manager" on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the Silicon Graphics IRIX Clients

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following packages are available within the install image on the installation media:

`TSM.sw.base`
Installs the backup-archive client (command-line and GUI) and administrative client (command-line).

`TSM.sw.api`
Installs the API.

`TSM.sw.web`
Installs the Web client.

To remove previous Tivoli Storage Manager client versions use the Software Manager (swmgr).

Use the following procedure to install the Tivoli Storage Manager clients:

1. Log in as the root user and mount the CD-ROM to `/cdrom`.
2. Enter the following directory path where the installation packages reside on the CD:

   ```
   /cdrom/tsmcli/sgi
   ```
3. Log in as the root user, insert the CD-ROM, and enter the following command:

   ```
   /usr/sbin/inst -A -f `pwd`
   ```

   Note: `` `pwd` `` may be replaced with the absolute name of the current directory.
4. To selectively install one or more components, enter the following command:

   ```
   /usr/sbin/inst -a -f `pwd` -I TSM.sw.base[,TSM.sw.api][,TSM.sw.web]
   ```

   Notes:

   a. You can also use the Software Manager (swmgr) to install selectively.
   b. The Web-client uses files of the backup-archive client component. Ensure that both components are the same level.

During installation:

- The Tivoli Storage Manager backup-archive files are installed in the `/usr/tivoli/tsm/client/ba/bin` directory.
- The API files are installed in the `/usr/tivoli/tsm/client/api/bin` directory.
- The Web client files are installed in the client directory.

After installation completes, see Chapter 2, “Configuring Tivoli Storage Manager” on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

Installing the Solaris Clients

Attention

For current installation and configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media. For current information concerning Tivoli Storage Manager, supported platforms, and documentation, refer to the Web site at: **http://www.tivoli.com/support/storage_mgr/tivolimain.html**

The following installation packages in Solaris packaging format are available on the CD:

tsmcli/solaris/TIVsmCba.pkg
Contains the backup-archive client (command-line and GUI), the administrative client (command-line), and the Web client.

tsmcli/solaris/TIVsmCapi.pkg
Contains the API, shared libraries, and samples.

tsmcli/solaris/TivsmCdoc.pkg
Contains the documentation.

To remove previous versions of Tivoli Storage Manager, log in as root and enter:

```
pkgrm TIVsmCba TIVsmCapi TIVsmCdoc TIVsmChsm
```

Note: TIVsmCapi cannot be uninstalled until the TIVsmCba is removed because the backup-archive client needs the API for Raw Logical Volume backup.

For older ADSM versions, enter:

```
pkgrm IBMadsm-w IBMadsm-c IBMadsm-a IBMadsm-h
```

Use the following procedure to install the Tivoli Storage Manager clients:

1. Log in as the root user and mount the CD-ROM to `/cdrom`.
2. Enter the following command and include the package name. For example, to install the backup-archive client, enter:

   ```
   pkgadd -d /cdrom/tsmcli/solaris/TIVsmCapi.pkg TIVsmCapi
   pkgadd -d /cdrom/tsmcli/solaris/TIVsmCba.pkg TIVsmCba
   ```

   Note: The Backup-archive client needs the API for Raw Logical Volume backup, so the API must be installed before the client.
3. If you want to install the documentation, enter:

   ```
   pkgadd -d /cdrom/tsmcli/solaris/TIVsmCdoc.pkg TIVsmCdoc
   ```
4. Answer *Yes* (y) to all questions during installation.

Note: To display the Tivoli Storage Manager help browser menus in your locale language, ensure the NLSPATH environment variable in the `/etc/profile` file contains the following path:

```
/usr/dt/lib/nls/msg/%L/%N.cat
```

During installation :

- The Tivoli Storage Manager backup-archive and Web client files are installed in the `/opt/tivoli/tsm/client/ba/bin` directory.
- The TSM administrative client (command line) is installed in the `/opt/tivoli/tsm/client/admin/bin` directory.
- The Tivoli Storage Manager API files are installed in the `/opt/tivoli/tsm/client/api/bin` directory.

- The TSM documentation files are installed in the `/opt/tivoli/tsm/client/books` directory.

After installation completes, see Chapter 2, "Configuring Tivoli Storage Manager" on page 25 for required and optional tasks to perform before using Tivoli Storage Manager.

The Tivoli Storage Manager clients work in conjunction with the Tivoli Storage Manager server. Contact your administrator to obtain backup or archive access to the server, or refer to the following publications to install and configure a Tivoli Storage Manager server:

Table 5. Tivoli Storage Manager Server Quick Start Publications

Publication Title	Order Number
Tivoli Storage Manager for AIX Quick Start	GC32-0770
Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
Tivoli Storage Manager for OS/390 and z/OS Quick Start	GC32-0777
Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
Tivoli Storage Manager for Windows Quick Start	GC32-0784

Chapter 2. Configuring Tivoli Storage Manager

Attention

For current configuration information for the Tivoli Storage Manager program product, refer to the README file that is shipped on the product installation media.

After installation, *required* configuration tasks include the following:

Task	Page
Creating and Modifying the Client Options File (Required Root User or Authorized User Task)	25
Registering Your Workstation with a Server (Required)	28

Optional configuration tasks include the following:

Task	Page
Creating an Include-Exclude List (Optional)	29
Setting Environment Variables	36
Creating a Default Client User Options File (Optional Root User or Authorized User Task)	26
Creating a Customized Client User Options File (Optional User Task)	27

Creating and Modifying the Client Options File (Required Root User or Authorized User Task)

During the installation, the sample client system options file dsm.sys.smp is placed in the default installation directory. Refer to the README file that is shipped on the product installation media for the location of the dsm.sys.smp file for your UNIX client.

The client system options file (dsm.sys) file is used to specify one or more servers to contact for services, and communications options for each server. It can also include authorization options, backup and archive processing options, scheduling options, and HSM space management options.

If you are a **root user** or authorized user, copy the dsm.sys.smp file to dsm.sys. It is assumed that the dsm.sys file is controlled by the system administrator.

Attention: If you are reinstalling and you want to keep your existing dsm.sys file intact, do not copy the dsm.sys.smp file to dsm.sys.

Edit dsm.sys to include the server or servers to which you want to connect. The following is an example of a client system options file stanza which contains the required options for a server you want users to contact. You can specify options for more than one server:

© Copyright IBM Corp. 1993, 2002

```
Servername              server_a
COMMmethod              TCPip
TCPPort                 1500
TCPServeraddress        almvmd.almaden.ibm.com
```

Note: If you are installing the Web client, you must also specify the ***passwordaccess***=*generate* option. See "Passwordaccess" on page 185 for more information.

Required options for each server stanza are:

servername
Specify the name you want to assign to a server to contact for services, for example, **server_a**. See "Servername" on page 206 for more information.

commmethod
Specifies the communication method you use to provide connectivity for client-server communication. If you do not specify ***commmethod***, it defaults to TCP/IP. See "Commmethod" on page 127 for more information.

tcpport
Specifies a TCP/IP port address for a server. You can obtain this address from your administrator. If you do not specify ***tcpport***, it default to 1500. See "Tcpport" on page 217 for more information.

tcpserveraddress
Specifies the TCP/IP address for a server. You can obtain this address from your administrator. See "Tcpserveraddress" on page 218 for more information.

Your client system options file (dsm.sys) can also include options to control backup and archive processing, authorization of stored files, and scheduling of tasks. See Chapter 9, "Setting Processing Options" on page 107 for more information.

Notes:

1. See "Setting Options in a File" on page 119 for more information about setting options in a file.
2. See "Client Options Reference" on page 121 for options that are supported on your platform, their possible values, and the syntactic rules for using them.
3. See "Communication Options" on page 109 for communication protocols supported for your UNIX client.

As the default, your client node contacts the first server identified in the client system options file (dsm.sys). You can specify a different server to contact by entering the ***servername*** option in your own client user options file (dsm.opt), or by entering that option with a command.

You can also specify a default server and a migration server (if you have the Tivoli Space Manager client installed on your workstation) in your client system options file (dsm.sys). For more information, see "Defaultserver" on page 135.

Creating a Default Client User Options File (Optional Root User or Authorized User Task)

The product installer placels a sample client user options file called dsm.opt.smp into the default installation directory. Refer to the `README` file that is shipped on the product installation media for the location of dsm.opt.smp for your UNIX client.

Figure 1 on page 27 shows the contents of the sample client user options file.

```
* SErvername       A server name defined in the dsm.sys file
```

Figure 1. Contents of the Sample Client User Options File

If you are a root user, you can create a default client user options file (dsm.opt) that can be used by all users on your workstation by using one of the following methods:

1. From the GUI:
   a. Click **Utilities** and then click **Setup Wizard**.
   b. Select **Create a new options file**.
   c. Follow the instructions on the screen.
2. From the UNIX command line:

   Copy dsm.opt.smp to dsm.opt or a new file name of your choice. The dsm.opt file must reside in the default installation directory or the directory pointed to by the DSM_CONFIG environment variable.

   Attention: If you are reinstalling and you want to keep your existing dsm.opt file intact, do not copy the dsm.opt.smp file to dsm.opt.

You can then edit your dsm.opt file as appropriate for your system. From the GUI, you can edit this file using the the preferences editor by opening the **Edit** menu and selecting **Preferences**.

Your client user options file (dsm.opt) can include options to control backup and archive processing, authorization of stored files, and scheduling of tasks. See Chapter 9, "Setting Processing Options" on page 107 for more information.

Notes:

1. See "Setting Options in a File" on page 119 for more information about setting options in a file.
2. See "Client Options Reference" on page 121 for options that are supported on your platform, and detailed information about each option.
3. See "Communication Options" on page 109 for communication protocols supported for your UNIX client.

Creating a Customized Client User Options File (Optional User Task)

If you are a user and want to use different options than those specified in the default client user options file (dsm.opt), you can create your own client user options file. You can set all the options that can be set in the default user options file.

For example, in the client user options file, you can use the ***domain*** option to specify the file systems you want to incrementally backup. The default is all locally mounted file systems except for `/tmp`.

You can use one of the following methods to create your own client user options file:

1. From the GUI:
   a. Open the **Utilities** menu and select **Setup Wizard**.
   b. Select **Create a new options file**.
   c. Follow the instructions on the screen.
2. Contact the root user on your workstation to determine the location of the sample client user options file dsm.opt.smp, and do the following:

a. Copy dsm.opt.smp to your home directory as dsm.opt, or a new file name of your choice. You can store your client user options file in any directory to which you have write access.
b. Set the DSM_CONFIG environment variable to point to your new client user options file. For instructions to set this variable, see section, "Setting Environment Variables" on page 36.

You can then edit your dsm.opt file as appropriate for your system or use the GUI preferences editor by opening the **Edit** menu and selecting **Preferences**.

Notes:

1. See "Setting Options in a File" on page 119 for more information about setting options in a file.
2. See "Client Options Reference" on page 121 for options that are supported on your platform, and detailed information about each option.
3. See "Communication Options" on page 109 for communication protocols supported for your UNIX client.

Registering Your Workstation with a Server (Required)

Authorized User

Before you can use Tivoli Storage Manager, you must register your client with the server. The process of setting up a node name and password is called *registration* and is performed by your Tivoli Storage Manager administrator.

There are two types of registration: *open* and *closed*. Your administrator chooses the type of registration for your site.

If you plan to use a Web client, you must have an administrative user ID with system privilege, policy privilege, client access authority, or client owner authority. When a new node is registered, an administrative user ID is automatically created for the node. By default, this node has client owner authority.

Using Closed Registration

With closed registration, an administrator must register your workstation as a client node with the server. If your enterprise uses closed registration, you need to provide the following information to your Tivoli Storage Manager administrator:

- Your node name (the value returned by the **hostname** command or the node name you specified with the ***nodename*** option).
- The initial password you want to use, if required.
- Contact information, such as your name, user ID, and phone number.

In addition to possibly defining certain options in your options file, your administrator defines the following for you:

- The policy domain to which your client node belongs. A policy domain contains policy sets and management classes, defined by your administrator, that control how Tivoli Storage Manager manages the files you back up and archive.
- Whether you can compress files before sending them to the server.
- Whether you can delete backup and archive data from server storage.

Using Open Registration

With open registration, you can register your workstation as a client node with the server.

The first time you start a session, Tivoli Storage Manager prompts you for information necessary to register your workstation with the server identified in your client options file. You need to supply your node name, a password, and contact information.

When you use open registration:
- Your client node is assigned to a policy domain named **standard**.
- You can define whether or not to compress files before sending them to the server. See "Compression" on page 131 for more information about the ***compression*** option.
- You can delete archived copies of files from server storage, but not backup versions of files.

If necessary, your administrator can change these defaults later.

Creating an Include-Exclude List (Optional)

Authorized User

This is an optional task but an important one. If you do not create an include-exclude list, Tivoli Storage Manager considers all files for backup services and uses the default management class for backup and archive services. For information on management classes and policy domains, see Chapter 8, "Understanding Storage Management Policies" on page 97.

You can create an include-exclude list to exclude a specific file or groups of files from backup services, and to assign specific management classes to files. Tivoli Storage Manager backs up any file that is not explicitly excluded. You should exclude Tivoli Storage Manager client directories from backup services. You can use the **query inclexcl** command to generate a list of the files that are currently being excluded from backup.

Specify the include-exclude list in your client system options file (`dsm.sys`). If you define more than one server in your `dsm.sys` file, each server must have its own include-exclude list. This list can also contain include-exclude statements obtained from the include-exclude files you specify with the ***inclexcl*** option.

Note: For the AIX DFS client: Specify an include-exclude file with the ***dfsinclexcl*** option and then specify the include-exclude list in that file *only*. See "Dfsinclexcl" on page 137 for more information.

When the client processes include-exclude statements, the include-exclude statements within the include-exclude file are placed at the position occupied by the ***inclexcl*** option in `dsm.sys`, in the same order, and processed accordingly.

See "Inclexcl" on page 162 for detailed information about specifying an include-exclude file using the ***inclexcl*** option.

You can use one of the following methods to create an include-exclude list or specify an include-exclude file:
1. From the client GUI, open the **Edit** menu and select **Preferences**. Then, in the Preferences dialog, click the **Include/Exclude** category.
2. From the client GUI, open the **Utilities** menu and select **Setup Wizard**.

You can create an include-exclude list by performing the following steps:
1. Determine your include and exclude requirements

2. Locate the server stanza in your client system options file (`dsm.sys`)

   Note: Each server stanza must have its own include-exclude list.
3. Enter your ***include*** and ***exclude*** statements using the appropriate include-exclude options as described in "Using Include-Exclude Options". Because Tivoli Storage Manager processes your include-exclude list from the bottom of the list up, it is important to enter all your include-exclude statements in the proper order. For example, in the following include-exclude list the `includefile.txt` file *is not* backed up:

   ```
   include /home/usr/includefile.txt
   exclude /home/usr/.../*
   ```

   However, in the following include-exclude list the `includefile.txt` file *is* backed up:

   ```
   exclude /home/usr/.../*
   include /home/usr/includefile.txt
   ```
4. If you wish, you can specify an include-exclude file using the ***inclexcl*** option. The file can be located in any directory to which all users on your workstation have read access. See "Inclexcl" on page 162 for more information.
5. Save the file and close it.
6. Restart Tivoli Storage Manager client to enable your new client system options file (`dsm.sys`).

Using Include-Exclude Options

This section provides the following:

- Brief descriptions of the ***include*** and ***exclude*** options that you can specify in your client system options file (`dsm.sys`). See table references for more information about each option.
- A minimum include-exclude list that excludes system files.
- A list of supported wildcard characters that you can use to include or exclude groups of files for processing.
- Examples of how you might use wildcard characters with ***include*** and ***exclude*** patterns.

Excluding File Spaces and Directories

Use ***Exclude.fs*** and ***Exclude.dir*** statements to exclude file spaces and all files and sub-directories in the specified directory from processing. Tivoli Storage Manager evaluates all ***Exclude.fs*** and ***Exclude.dir*** statements *first*, and removes the excluded file spaces, directories, and files from the list of objects available for processing. The ***Exclude.fs*** and ***Exclude.dir*** statements override all include statements that match the pattern.

Table 6. Options for Excluding File Spaces and Directories

Option	Description	Page
exclude.fs	Excludes file spaces matching the pattern. The client does not consider the specified file space for processing and the usual deleted-file expiration process cannot occur. If you exclude a file space that was previously included, existing backup versions remain on the server subject to retention rules specified in the associated management class definition. See "Exclude Options" on page 152 for more information.	152

Table 6. Options for Excluding File Spaces and Directories (continued)

Option	Description	Page
exclude.fs.nas	Excludes file systems on the NAS filer from an image backup when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS filers. The **backup nas** command ignores all other exclude statements including ***exclude.fs*** and ***exclude.dir*** statements. This option is for AIX, AIX 5L, and Solaris clients *only*.	152
exclude.dir	Excludes a directory, its files, and all its subdirectories and their files from backup processing. For example, `exclude.dir /test/dan/data1` excludes `/test/dan/data1`, its files, and all its subdirectories and their files. However, you can still back up `/test/dan/data1`, its files, and all its subdirectories and their files using a selective backup, as follows: `dsmc sel -subdir=yes /test/dan/data1/` However, the next time you perform an incremental backup, these backup versions are expired. If you exclude a directory that was previously included, Tivoli Storage Manager marks existing backup versions of the files and directories beneath it inactive during the next incremental backup. Use this option to exclude a portion of your data in which no underlying files need to be backed up. The Tivoli Storage Manager Client API does not support this option.	152

Controlling Backup, Archive, and Image Processing

After Tivoli Storage Manager evaluates all ***exclude.fs*** and ***exclude.dir*** statements, the following options are evaluated against the remaining list of objects available for processing.

If you exclude an object that was previously included, Tivoli Storage Manager marks existing backup versions inactive during the next incremental backup.

Table 7. Options for Controlling Backup, Archive, and Image Processing

Option	Description	Page
	Backup Processing	
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	*These options are equivalent*. Use these options to exclude a file or group of files from backup services and space management services (if the HSM client is installed). The ***exclude.backup*** option only excludes files from normal backup, but not from HSM.	152
include ***include.backup*** ***include.file***	*These options are equivalent*. Use these options to include files or assign management classes for backup processing.	163
	Archive Processing	
exclude.archive	Excludes a file or group of files from archive services.	152
include ***include.archive***	*These options are equivalent*. Use these options to include files or assign management classes for archive processing.	163
	Image Processing	

Table 7. Options for Controlling Backup, Archive, and Image Processing (continued)

Option	Description	Page
exclude.image	Excludes mounted file systems and raw logical volumes that match the pattern from image processing. This option is valid for AIX, AIX 5L, HP-UX, Solaris, and Linux86.	152
exclude.fs.nas	Excludes file systems on the NAS filer from an image backup when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS filers. The **backup nas** command ignores all other exclude statements including ***exclude.fs*** and ***exclude.dir*** statements. This option is for AIX, AIX 5L, and Solaris clients *only*.	152
include.image	Includes a file space or logical volume, assigns a management class, or allows you to assign one of several image backup processing options to a specific logical volume when used with the **backup image** command. The **backup image** command ignores all other include options. This option is valid for AIX, AIX 5L, HP-UX, Solaris, and Linux86 only.	163
include.fs.nas	Assigns a management class when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS filers. The **backup nas** command ignores all other include statements. This option is for AIX, AIX 5L, and Solaris clients *only*.	163

Controlling Compression and Encryption Processing

After Tivoli Storage Manager evaluates ***Exclude.fs, Exclude.dir***, and any other include-exclude options controlling backup, archive, image, and system objects, it uses the following options to determine which files undergo compression, encryption, or subfile processing.

Table 8. Options for Controlling Compression and Encryption Processing

Option	Description	Page
	Compression Processing	
exclude.compression	Excludes files from compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	152
include.compression	Includes files for compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	163
	Encryption Processing	
exclude.encrypt	Excludes files from encryption processing.	152
include.encrypt	Includes files for encryption processing.	163

Excluding System Files

For UNIX, we recommend that you have the following minimum include-exclude list in your include-exclude options file:

```
exclude /unix/
exclude.dir /unix/
exclude /.../core
```

If you are using AFS, also specify:

```
exclude /usr/vice/cache/*
exclude /var/vice/cache/*
```

These are system files that cannot be recovered without possibly corrupting the operating system.

Including and Excluding Groups of Files

To specify groups of files that you want to include or exclude, use the wildcard characters listed in Table 9. This table applies to ***include*** and ***exclude*** statements *only*. For information about using wildcard characters in Tivoli Storage Manager commands, see "Using Wildcard Characters" on page 277.

Table 9. Wildcard and Other Special Characters

Character	Function
?	The match-one character matches any single character *except* the directory separator; it does not match the end of the string. For example: • The **pattern** ab?, **matches** abc, but **does not match** ab, abab, or abzzz. • The **pattern** ab?rs, **matches** abfrs, but **does not match** abrs, or abllrs. • The **pattern** ab?ef?rs, **matches** abdefjrs, but **does not match** abefrs, abdefrs, or abefjrs. • The **pattern** ab??rs, **matches** abcdrs, abzzrs, but **does not match** abrs, abjrs, or abkkkrs.
*	The match-all character. For example: • The **pattern** ab*, **matches** ab, abb, abxxx, but **does not match** a, b, aa, bb. • The **pattern** ab*rs, **matches** abrs, abtrs, abrsrs, but **does not match** ars, or aabrs, abrss. • The **pattern** ab*ef*rs, **matches** abefrs, abefghrs, but **does not match** abefr, abers. • The **pattern** abcd.*, **matches** abcd.c, abcd.txt, but **does not match** abcd, abcdc, or abcdtxt.
/...	The match-*n* character matches zero or more directories.

/	The directory separator character limits the scope of the search for the matching *n* characters and directories. If a pattern does not begin with a directory separator (or one does not follow the file system specification), a match-all directories is appended to the pattern. For example, these patterns are equivalent:
	`core`
	`/.../core`

[	The open character-class character begins the enumeration of a character class. For example: `xxx[abc] matches xxxa, xxxb, or xxxc.`
–	The character-class range includes characters from the first character to the last character specified. For example: `xxx[a-z] matches xxxa, xxxb, xxxc, ... xxxz.`
\	The literal escape character. When used within a character class, it treats the next character literally. When used outside of a character class, it is not treated in this way. For example, if you wish to include the ']' in a character class, enter [...\]...]. The escape character removes the usual meaning of ']' as the close character-class character.
]	The close character-class character ends the enumeration of a character class.

Examples Using Wildcards with Include and Exclude Patterns

Table 10 contains examples of ways you might use wildcard characters with ***include*** and ***exclude*** patterns. For more information about using the ***exclude.backup*** option, see "Exclude Options" on page 152.

Note: The **include** and **exclude** commands do not work with symbolic links to directories. Do not use `/u` in these commands. For example, instead of entering:

```
include /u/tmp/save.fil
```

enter:

```
include /home/tmp/save.fil
```

The **exclude** command works with symbolic links to directories when you enter the backup command with the absolute path that contains the symbolic link.

You cannot use wildcard characters with the ***include.fs.nas*** and ***exclude.fs.nas*** options.

Table 10. Using Wildcard Characters with Include and Exclude Patterns

Task	Pattern
Exclude all files during backup with an extension of *bak*, except those found on the `/usr` file system in the `dev` directory.	`exclude *.bak` `include /usr/dev/*.bak`
Exclude all files and directories in any `tmp` directory that might exist, *except* for the file `/home/tmp/save.fil`. Include this file.	`exclude /.../tmp/.../*` `include /home/tmp/save.fil`
Exclude any .o file in any directory on the `/usr1`, `/usr2`, and `/usr3` file systems.	`exclude /usr[1-3]/.../*.o`
Exclude the .o files found in the root directory in the `usr2` file system *only*.	`exclude /usr2/*.o`
Exclude any file that resides under the `tmp` directory found in any file space .	`exclude /.../tmp/.../*`
Exclude the entire directory structure `/var/spool` from all processing.	`exclude.dir /var/spool`
Exclude all file systems mounted anywhere in the `/test/myfs/fs01` and `/test/myfs/fs02` directory tree from backup processing.	`exclude.fs /test/myfs/.../*` `exclude.fs /test/myfs/*`
Exclude the `/home/mydir/test1` directory and any files and subdirectories under it.	`exclude.dir /home/mydir/test1`
Exclude all directories under the `/home/mydir` directory with names beginning with `test`.	`exclude.dir /home/mydir/test*`
Exclude all directories directly under the `/mydir` directory with names beginning with `test`, on any file system.	`exclude.dir /.../mydir/test*`
Exclude the raw logical volume from image backup. (You must use the */* suffix to include or exclude logical volumes).	`exclude.image /dev/hd0/*/*`

Processing Include and Exclude Options

The Tivoli Storage Manager server can define include-exclude options using the ***inclexcl*** parameter in a client option set. The include-exclude statements specified

by the server are evaluated along with those in the client user options file (`dsm.opt`). The server include-exclude statements are always enforced and placed at the bottom of the include-exclude list and evaluated before the client include-exclude statements.

If the client system options file (`dsm.sys`) include-exclude list contains one or more ***inclexcl*** options that specify include-exclude files, the include-exclude statements in these files are placed in the list position occupied by the ***inclexcl*** option and processed accordingly.

When performing an incremental backup, Tivoli Storage Manager evaluates all ***exclude.fs*** and ***exclude.dir*** statements *first*, and removes the excluded file spaces, directories, and files from the list of objects available for processing. See "Excluding File Spaces and Directories" on page 30 and "Exclude Options" on page 152 for more information about the ***exclude.fs*** and ***exclude.dir*** options.

Note: Because directory branches excluded using the ***exclude.dir*** option do not display in the GUI, setting this option prevents you from performing either selective or incremental backups of data in the excluded directories from the GUI. However, you can still perform selective backups of such data from the command line.

After evaluating all ***exclude.fs*** and ***exclude.dir*** statements, Tivoli Storage Manager evaluates the include-exclude list from the bottom up and stops when it finds an include or exclude statement that matches the file it is processing. The order in which the include and exclude options are entered therefore affects which files are included and excluded. See Chapter 9, "Setting Processing Options" on page 107 for more information about the order in which all options are processed.

To display a list of all include-exclude statements in effect on your client workstation in the actual order they are processed, use the **query inclexcl** command. See "Query Inclexcl" on page 308 for more information.

The client program processes the ***include*** and ***exclude*** options as follows:

1. Files are checked; directories are *only* checked if the ***exclude.dir*** option is specified.
2. ***File names are compared to the include-exclude list from the bottom up.*** When a match is found, the processing stops and checks whether the option is ***include*** or ***exclude***. If the option is ***include***, the file is backed up. If the option is ***exclude***, the file *is not* backed up.
3. If a match *is not* found, files listed are implicitly included and backed up.
4. If policy administration is in effect, files are backed up according to the default management class, or the management class you specify on a matching include option.

The following examples demonstrate *bottom up* processing.

Example 1

Assume that `/home` is defined as the domain, and you defined the following statements for the ***include*** and ***exclude*** options:

```
exclude *.o
include /home/foo/.../*.o
exclude /home/foo/junk/*.o
```

The file being processed is: `/home/foo/dev/test.o`. Processing follows these steps:

1. Rule 3 (the last ***include*** or ***exclude*** statement defined) is checked *first* because of bottom up processing. The file `/home/foo/junk/*.o` does not match the file name that is being processed.
2. Processing moves to Rule 2 and checks. This time, file `/home/foo/.../*.o` matches the file name that is being processed. Processing stops, the option is checked, and it is ***include***.
3. File `/home/foo/dev/test.o` is backed up.

Example 2

Assume that `/home` is defined as the domain, and you defined the following statements for the ***include*** and ***exclude*** options:

```
exclude *.obj
include /home/foo/.../*.o
exclude /home/foo/junk/*.o
```

The file being processed is: `/home/widg/copyit`. Processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and finds no match.
4. Because a match is not found, file `/home/widg/copyit.bat` is implicitly included and backed up.

Example 3

Assume that `/home` is defined as the domain, and that you defined the following statements for the ***include*** and ***exclude*** options:

```
exclude /.../*.o
include /home/foo/.../*.o
exclude /home/foo/junk/*.o
```

The current file being processed is: `/home/lib/objs/printf.o`. Processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and a match is found.
4. Processing stops, the option is checked, and it is ***exclude***.
5. File `/home/lib/objs/printf.o` is not backed up.

Setting Environment Variables

Setting Language Environment Variables

The Tivoli Storage Manager client automatically detects the language of the system locale and displays Tivoli Storage Manager for that language. For example, a supported operating system displays Tivoli Storage Manager in French by default. If Tivoli Storage Manager cannot load the French message catalog, it will default to the American English language pack. For example, if the client is running on an unsupported locale/language combination, such as French/Canada or Spanish/Mexico, Tivoli Storage Manager defaults to American English.

You can use the **LANG** environment variable to specify the language for the AIX, AIX 5L, HP-UX, Linux, and Solaris clients. For all other UNIX clients, only American English is available.

Tivoli Storage Manager supports the following language locales:

Languages	AIX and AIX 5L	HP-UX	Solaris	Linux X86
American English	en_US	en_US	en_US	en_US
Simplified Chinese	zh_CN	zh_CN.eucCN	zh_CN	zh_CN
Traditional Chinese	zh_TW, Zh_TW.big5	zh_TW.eucTW	zh_TW, Zh_TW.big5	zh_TW.big5
Japanese	ja_JP, Ja_JP	ja_JP.eucJP	ja_JP	ja_JP
Korean	ko_KR	ko_KR.eucKR	ko_KR	ko_KR
French (Standard)	fr_FR			fr_FR
German (Standard)	de_DE			de_DE
Italian (Standard)	it_IT			it_IT
Portuguese (Brazil)	pt_BR			pt_BR

Note:

- Traditional Chinese BIG5 has locale zh_TW on Linux, while zh_TW is used on other platforms for eucTW.
- zh_CN.GB18030 is supported in Linux X86, but only on the command line.
- Only the command line interface is supported for Linux X86.
- Not all UNIX shells are able to show multi-byte characters.
- For Motif: Make sure that your command line shell is capable of showing the selected locale. The native GUI has to be started from a Window Manager (for example, CDE, KDE2, or Gnome) that supports the selected locale.

To set the **LANG** environment variable to Japanese, type the following:

```
export LANG=ja_JP
```

Note: To display the Tivoli Storage Manager help browser menus in the language of your current locale, insure that the NLSPATH environment variable in the `/etc/profile` file contains the following path:

```
NLSPATH=/usr/dt/lib/nls/msg/%L/%N.cat:$NLSPATH export NLSPATH
```

If the **LANG** environment variable is set to **C**, POSIX (limiting the valid characters to those with ASCII codes less than 128), or other values with limitations for valid characters, the backup-archive client skips files containing invalid characters with ASCII codes higher than 127.

If you are using a single-byte character set (SBCS) like English as your language environment, all file names are valid and backed up by the backup-archive client. Multi-byte characters are interpreted as a set of single bytes all containing valid characters. If you are using multi-byte character sets (MBCS) as your language environment, the backup-archive client backs up file names that consist of valid characters in the current environment.

For example, a file name consisting of Japanese characters may contain invalid multi-byte characters if the current language environment is a Chinese character

set. Files containing invalid multi-byte characters are not backed up and are not shown by the graphical user interface. If such files are found during backup, the `dsmerror.log` will list the skipped files.

When using the backup-archive client scheduling mode to back up a whole system, it is strongly recommended to set the **LANG** environment variable to **en_US** (or some other SBCS language) to avoid skipped files.

Setting Font Defaults

Running the backup-archive GUI outside the CDE desktop could result in errors due to unresolved **fonts**. Ensure that all required fonts are available for your language environment when running the backup-archive GUI outside the CDE desktop.

Note: The command **xrdb -m .Xdefaults** must be issued to update the X System on demand.

When running the backup-archive GUI under Motif, and outside the CDE desktop, add the following entry to the `.Xdefaults` file in your home directory:

```
dsm*fontList: -dt-interface system-medium-r-normal-xs*-*-*-*-*-*-*-*-*:
```

For Linux X86, add the following entries to the *.Xdefaults* file in your home directory. Remove the ! (exclamation point) in front of the **dsm*fontList** entry to activate the appropriate locale.

```
!
! ja_JP locale
!
!dsm*fontList:  -adobe-helvetica-medium-r-*--14-*-*-*-*-*-*-*;\
!               -misc-*-medium-r-*--14-*-*-*-*-*-*-*:

!
! zh_CN locale
!
!dsm*fontList:  -*-helvetica-medium-r-normal-*-*-120-*-*-*-*-iso8859-*;\
!               -isas-fangsong ti-medium-r-normal--16-160-72-72-c-160-gb2312.1980-0:

!
! zh_TW locale
!
!dsm*fontList:  -*-helvetica-medium-r-normal-*-*-140-*-*-*-*-iso8859-*;\
!               -default-ming-medium-r-normal--16-*-*-*-c-160-big5-0:

!
! ko_KR
!
!dsm*fontList:  -*-helvetica-medium-r-*-*-*-120-*-*-*-*-iso8859-*;\
!               -daewoo-mincho-medium-r-normal--16-120-100-100-c-160\
                -ksc5601.1987-*;*-r-*:

!
! ru_RU
!
!dsm*fontList: -sony_windows_1251-fixed-medium-r-normal--16-120-100-100\
               -c-80-microsoft-cp1251

!
```

Setting Processing Environment Variables

There are three environment variables you can set which affect Tivoli Storage Manager processing:

DSM_DIR

Points to the executable file dsmtca, the resource files, and the dsm.sys file. You cannot specify the root directory for DSM_DIR. If DSM_DIR is not set, the executables are expected in the default installation directory.

When you request an image or a NAS backup or restore, Tivoli Storage Manager uses the DSM_DIR environment variable to locate the corresponding plug-in library. If DSM_DIR is not set, the client will look for the plug-in library in the following directories: /usr/tivoli/tsm/client/ba/bin/plugins for AIX and AIX 5L, or /opt/tivoli/tsm/client/ba/bin/plugins for Solaris.

DSM_CONFIG

Contains the fully-qualified path and file name of the client user options file for users who create their own personalized options file.

If DSM_CONFIG is *not* set, the client user options file is expected to satisfy both of these requirements:

1. The options file should be named dsm.opt
2. The options file should reside in the directory pointed to by DSM_DIR

However, if DSM_DIR is *not* set, then dsm.opt is expected in the default installation directory.

DSM_LOG

Points to the directory where you want the dsmerror.log, dsmwebcl.log, and dsmsched.log files to reside. The dsmerror.log file cannot be a symbolic link. In addition, you cannot specify the root directory for DSM_LOG. The error log file contains information about any errors that occur during processing. The client creates the error log to help the Tivoli Storage Manager technical support team diagnose severe errors.

If you define DSM_LOG, Tivoli Storage Manager writes messages to dsmerror.log, dsmwebcl.log, and dsmsched.log files in the directory you specify.

If you define DSM_DIR, but not DSM_LOG, Tivoli Storage Manager writes messages to dsmerror.log, dsmwebcl.log, and dsmsched.log in the directory specified by DSM_DIR.

If you do not define DSM_LOG or DSM_DIR, Tivoli Storage Manager writes messages to dsmerror.log, dsmwebcl.log, and dsmsched.log files in the current directory.

If you use the ***errorlogname*** option to specify the fully qualified path where you want to store the dsmerror.log file, this value overrides the definitions in the DSM_LOG or DSM_DIR environment variables. The dsmwebcl.log and dsmsched.log files will be created in the same directory as dsmerror.log.

When Tivoli Storage Manager cannot write to the log file, it issues a warning message.

Setting Bourne and Korn Shell Variables

For the Bourne or Korn shell, enter the environment variables in the .profile file in your **$HOME** directory. For example:

```
DSM_DIR=/home/davehil
DSM_CONFIG=/home/davehil/dsm.opt
DSM_LOG=/home/davehil
export DSM_DIR DSM_CONFIG DSM_LOG
```

where /home/davehil/dsm.opt is the path and file name for your client user options file, and /home/davehil is the directory where you want to store the dsmerror.log file, executable file, resource files, and dsm.sys file.

Setting C Shell Variables

For the C shell, add the DSM_CONFIG, DSM_LOG and DSM_DIR variables to .cshrc in your $HOME directory. For example, if /home/davehil/dsm.opt is the path and file name of your client user options file, and /home/davehil is the directory in which you want to store the dsmerror.log file:

```
setenv DSM_CONFIG /home/davehil/dsm.opt
setenv DSM_LOG /home/davehil
```

Setting API Environmental Variables

If you have installed the Tivoli Storage Manager client API, set the following environment variables:

DSMI_DIR
Points to your installation directory. The files dsmtca, dsm.sys, and the language files must reside in the directory pointed to by DSMI_DIR. This environment variable must be present.

DSMI_CONFIG
Full path name of your own client user options file (dsm.opt).

DSMI_LOG
Path for dsmerror.log. (cannot be a symbolic link)

Note: End users of applications developed with the API should consult the installation directions for that application for special path names or guidelines for options. Ensure that directories in the environment variables are specified in the path statement. The location of the API library is especially important.

Chapter 3. Getting Started

This chapter includes instructions for the following tasks:

Task	Page
Starting a GUI Session	42
Starting a Command Line Session	42
Using Batch Mode	43
Using Interactive Mode	43
Starting a Web Client Session	44
Tivoli Storage Manager Firewall Support	47
Starting the Client Scheduler Automatically	48
Changing Your Password	48
Sorting File Lists	49
Displaying Online Help	50
Ending a Session	50

Tivoli Storage Manager Client Authentication

When using the native backup-archive GUI or command line clients, or the Web client, you can logon using a nodename and password *or* administrative user ID and password. Tivoli Storage Manager prompts for your user ID and compares it to the configured nodename. If they match, Tivoli Storage Manager attempts to authenticate the user ID as a nodename. If the authentication fails or if the user ID does not match the configured nodename, the client attempts to authenticate the user ID as an administrative user ID.

To use an administrative user ID with any of the backup-archive clients, the user ID must have one of the following authorities:

- *System privilege* - Authority over the entire system.
- *Policy privilege* - Authority over the node's domain.
- *Client owner* - Authority over the configured nodename. With client owner authority, you own the data and have physical access to it.

To use the Web Client, you need to have an administrative user ID with client access authority over the configured nodename. From the Web Client, you can back up and restore files on the client machine you are remotely accessing. However, you cannot use a remote Web Client to restore files to your local machine. With client access authority you do not have physical access to the data. If you want access to the Web Client for your own use, but wish to prevent administrators with client access authority from accessing your machine remotely, specify the ***revokeremoteaccess*** option in your options file. See "Revokeremoteaccess" on page 198 for more information

Client access authority is not sufficient to access the backup-archive client, command line client, and native GUI. You must possess at least client owner authority.

© Copyright IBM Corp. 1993, 2002

You can use the ***virtualnodename*** option to temporarily access your node's data from another machine. This option differs from the ***nodename*** option in that, if ***passwordaccess***=*generate* is specified along with the ***virtualnodename*** option, the password is not stored on the local machine. If you specify the ***nodename*** option, the password is stored on the local machine. See "Virtualnodename" on page 227 for more information about the ***virtualnodename*** option.

Starting a GUI Session

check to see if a session is already started; look on your workstation desktop for the Tivoli Storage Manager icon.

The Tivoli Storage Manager GUI must be run from the X Window System. If you see the Tivoli Storage Manager icon on your desktop, Tivoli Storage Manager is already running. Double-click the icon to open the Tivoli Storage Manager window. If the Tivoli Storage Manager icon does not display on your desktop, you should start Tivoli Storage Manager using the **dsm** command. Tivoli Storage Manager can run as either a *foreground* or *background* process.

To run in the foreground, enter:

```
dsm
```

To run in the background, enter:

```
dsm &
```

Tivoli Storage Manager locates the *client user options* file (`dsm.opt`) and starts with the options you specify in that file. See "Creating and Modifying the Client User Options File" on page 108 for more information about the client options file.

Password and User ID

Your administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. Contact your administrator if you do not know your password. For information about changing your password, see "Changing Your Password" on page 48.

Attention: If you are working on an AIX workstation, and you want to back up or archive **AFS or DFS** files, ask the root user responsible for setting up Tivoli Storage Manager on your workstation if you can use the AFS or DFS version of Tivoli Storage Manager. See Chapter 4, "Backing Up Files and Directories" on page 53 for more information.

Configuration Wizard

When the GUI client starts initially and does not find an options file, the setup wizard guides you through the configuration process. You can launch the setup wizard to modify your setup files at any time by opening the **Utilities** menu and selecting **Setup Wizard** from the client GUI's main window.

Note: The **Setup Wizard** is not available through the Web client.

Starting a Command Line Session

An alternate way to start the client is from the command line. Start a command line session using one of the following methods:

- On the command line, change directory to the Tivoli Storage Manager installation directory and enter **dsmc** followed by the command, if you want to run a single command (*batch mode*).
- On the command line, change directory to the Tivoli Storage Manager installation directory and enter **dsmc**. This places you in *interactive mode*, permitting you to run several commands without preceding each with **dsmc**.

Your administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. If you do not know your password, contact your administrator.

You can start a client command session in either batch or interactive mode.

Using Batch Mode

Use *batch* mode to enter a single client command. When you use batch mode, you must precede the command with **dsmc**.

If a Tivoli Storage Manager password is required at your server, Tivoli Storage Manager prompts you for your password each time you enter a command. For example, to issue the **incremental** command, enter the following at the **$** prompt:

```
dsmc incremental
```

When you type in your password and press Enter, the password does not display on your screen.

Using Interactive Mode

Use *interactive* mode when you want to issue a series of commands. Because Tivoli Storage Manager establishes the connection to the server only once for interactive mode, you can process a series of commands more quickly in interactive mode than in batch mode.

To start a client command session in interactive mode, enter the **dsmc** or **dsmc loop** command. When you press Enter, this prompt displays on your screen:

```
tsm>
```

When you are in interactive mode, do not precede commands with **dsmc**. For example, instead of typing **dsmc archive** to archive a file, type only **archive**.

Depending upon the current setting of your ***passwordaccess*** option, Tivoli Storage Manager may prompt you for your password the first time you enter a command in an interactive session.

When you type your password and press Enter, the password does not display on your screen. If Tivoli Storage Manager is unable to authenticate your ID and password, you cannot use Tivoli Storage Manager services.

After you start an interactive session, some options are valid in interactive mode and *remain in effect* throughout the session unless you reenter them with a different setting. However, most options are valid only on the initial command line. To identify which options must be entered in this way, see Chapter 10, "Using Options with Commands" on page 231. If Tivoli Storage Manager does not find the dsm.sys file, it displays an error message and stops processing. In this case, see your administrator to determine the location of the option file Tivoli Storage Manager should use.

See Chapter 11, "Using Commands" on page 271 for information on how to start and use the command line client.

Starting: Additional Considerations

You can include options as arguments to **dsm** and **dsmc** commands. For example, you can use options to modify the format that displays dates, times, and numbers, or to include your password so that Tivoli Storage Manager does not prompt for it.

In addition, if you have more than one server available to you, and you want to contact a different server for backup-archive services (other than the one specified in your client user options file), specify the server with the ***servername*** option. For example:

```
dsm -servername=server&us;b
```

Starting a Web Client Session

You can use the Web client to perform backup, archive, restore, and retrieve operations from workstations or platforms that support at least a JRE 1.3.1 Swing-enabled browser. The Web client facilitates the use of assistive devices for users with disabilities and contains improved keyboard navigation. The native look and feel of the platform running the browser is preserved.

The Web client runs on the following browsers:
- Netscape Navigator 6.0 or later with the Java support option installed.
- Netscape Navigator 4.7 or later with Java Plug-in 1.3.1
- Microsoft Internet Explorer 5.0 or later with Java Plug-in 1.3.1

To run the Web Client from Netscape browsers, **Enable JavaScript** must be checked. This setting is enabled by default, but to verify it:
1. Open Netscape Navigator's **Edit** menu and select **Preferences**.
2. In the Preferences dialog under Category, select **Advanced**.
3. Ensure there is a check mark next to **Enable JavaScript**.

For Microsoft Internet Explorer browsers, you must enable the **Scripting of Java applets**. This setting is also enabled by default, but to verify it:
1. Open the **Tools** menu and select **Internet Options**
2. From the Internet Options dialog, select the **Security** tab.
3. Click the Web content zone in which you will be using the Tivoli Storage Manager Web client and then click the **Custom Level** button.
4. In the Security Settings dialog, ensure that **Enable** is selected under the **Scripting of Java applets** setting.

If your browser does not have the correct level of the Java plug-in, the Web client will notify you and will try to automatically install the correct plug-in for you.
- For Microsoft Internet Explorer browsers: The Web client will automatically download and install the 1.3.1_01 JRE Plug-in for you. If a different level of the JRE exists on your workstation, the 1.3.1_01 JRE is installed into a separate directory.
- For Netscape browsers: The Tivoli Storage Manager Web client will provide the link to the web site where you can download the latest 1.3.1 plug-in. Netscape browsers do not support the automated plug-in and JRE installation.
- For browsers running on HP, AIX, and SGI platforms: Downloading the plug-in and JRE requires registration at their web sites, so the Tivoli Storage Manager

Web client cannot automate the JRE installation on these platforms. Instead, the Web client displays a message containing a link to the appropriate URL from which you can manually install the JRE.

You can download and install the JRE 1.3.1 (unless otherwise noted) plug-in manually from the appropriate URL:

- For Windows, Solaris, Linux:

  `http://java.sun.com/j2se/1.3/jre/`
- AIX:

  `http://www-106.ibm.com/developerworks/java/jdk/aix/index.html`
  `Version 1.3.0`
- HP-UX:

  `http://www.hp.com/products1/unix/java/java2/sdkrte1_3/downloads/index.html`
- SGI IRIX:

  `http://www.sgi.com/developers/devtools/languages/javaplugin131.html`

Note: **Note for proxy server users**: The JRE 1.3.1 may return a security exception if the Tivoli Storage Manager Web Client attempts to open a TCP/IP socket to a socks server to communicate with the Tivoli Storage Manager Remote Client Agent. To avoid this, you can use one of the following methods to bypass a proxy server, allowing the Web client to establish a direct connection to the Agent machine:

- **Change your Java plug-in settings**:

  For Windows:

  1. Open the Windows **Start** menu and select **Settings** —→ **Control Panel**.
  2. In the Control Panel, double-click **Java Plugin**.
  3. In the Java Plug-In Control Panel, select the **Proxies** tab and uncheck the **Use browser settings** check box.

  For UNIX:

  1. Change directory to the installation directory of your JRE, and then change directory to the `bin` directory.
  2. Run the `JavaPluginControlPanel` executable and click the **Proxies** tab.
  3. Uncheck **Use browser settings**.
- **Change your browser settings to enable a direct connection to the Internet**:
  - For Netscape Navigator: Open the **Edit** menu and select **Preferences**. Under Category, expand the **Advanced** section, select **Proxies**, and click **Direct connection to the Internet**.
  - For Internet Explorer: Open the **Tools** menu and select **Internet Options...**. Select the **Connections** tab, and click the **LAN Settings** button. Uncheck the **Use a proxy server** check box.

Additional information about running Swing applets can be found in Sun's Java Tutorial:

`http://java.sun.com/docs/books/tutorial/uiswing/start/swingApplet.html`

You can back up and restore your own data, or an administrator can centralize the backup or restore operations of many clients. To use the Web client, specify the URL of the client workstation running the Web client in your Web browser. You also need to specify the local host port number; the default is 1581. The Web client is supported when used in conjunction with a Tivoli Storage Manager server that is Version 3 or higher.

Note: Entering a different URL or pressing the browser **Back** button during an operation disconnects the Web client and causes the current operation to end. However, network attached storage (NAS) operations will continue after disconnect.

Setting User Privileges

If you plan to use the Web client, ensure that you were assigned an administrative user ID with system privilege, policy privilege, client access authority, or client owner authority. See "Tivoli Storage Manager Client Authentication" on page 41 for more information about these authorities.

Note: Use the ***revokeremoteaccess*** option to restrict an administrator with client access privilege from accessing your workstation through the Web client. Administrators with client owner privilege, system privilege, or policy privilege can access the Web client. See "Revokeremoteaccess" on page 198 for more information about the ***revokeremoteaccess*** option. See "Tivoli Storage Manager Client Authentication" on page 41 for more information about access authorities.

Installing and Using the Web Client

If you did not install the Web client during the installation process, you can use the command line to install and configure it.

To install and configure the Web client from the command line, perform the following steps:

1. Ensure that you specify ***passwordaccess*** *generate* in the client system options file (dsm.sys). For more information on ***passwordaccess***, see "Passwordaccess" on page 185.
2. To generate the Tivoli Storage Manager password, start the backup-archive client by entering:

   ```
   dsmc query session
   ```

   when prompted, enter your user ID and password.
3. Install the Client Acceptor Service by entering the following command:

   ```
   dsmcutil install cad /name:"TSM CAD" /node:nodename /password:password
   ```
4. Install the Remote Client Agent Service by entering the following command:

   ```
   dsmcutil install remoteagent /name:"TSM AGENT" /node:nodename
        /password:password /partnername:"TSM CAD"
   ```
5. Start the client acceptor service by entering:

   ```
   dsmcad
   ```

   The TSM Remote Client Agent service does not need to be started manually. It is automatically started by the TSM Client Acceptor service when needed.

   The only options applicable to the **dsmcad** program are ***optfile***, ***httpport***, ***httpsport***, and ***webports***. You can specify the ***httpport***, ***httpsport***, and ***webports*** options in the `dsm.sys` file. You can specify the ***optfile*** option on the command line only.

   All Web client messages are written to the Web client log file, `dsmwebcl.log`. Error messages are written to the error log file `dsmerror.log`, or the file you specify with the ***errorlogname*** option. The `dsmwebcl.log` and `dsmerror.log` files

reside in the directory you specify with the DSM_LOG environment variable or in the current working directory. See Chapter 9, “Setting Processing Options” on page 107 for more information.

6. To access the Web client, enter the following URL from any supported browser:

   ```
   http://your_machine_name:1581
   ```

   where *your_machine_name* is the host name of the machine running the Web client.

Port 1581 is the default port number. Your administrator can set a different port number using the ***httpport*** option. See “Httpport” on page 159 for more information.

You can also access the Web client workstation through the Web administrative GUI. To use the Web client on AIX or AIX 5L with secure socket layer (SSL) communications, or for more information about Tivoli Storage Manager client services, see Appendix D, “Web Client Secure Socket Layer” on page 353.

Use the ***httpsport*** option to specify a TCP/IP port address for the HTTPS secure socket layer (SSL) interface to the Web client. See “Httpsport” on page 160 for more information.

Tivoli Storage Manager Firewall Support

In most cases, the Tivoli Storage Manager server and clients can work across a firewall. The ports that the client and server need to communicate must be opened in the firewall by the firewall administrator. Because every firewall is different, the firewall administrator may need to consult the instructions for the firewall software or hardware in use.

The ports that the firewall needs to define are those ports that are needed for the client to connect to the Tivoli Storage Manager server. If the server is listening on port 1500 then the firewall software needs to forward the port to the Tivoli Storage Manager server machine.

To allow clients to communicate with a server across a firewall, you must open the TCP/IP port for the server using the ***tcpport*** option in the server options file. The default TCP/IP port is 1500.

To allow the Web client to communicate with remote workstations across a firewall, you must open the HTTP port for the remote workstation using the ***httpport*** option in the remote workstation’s client option file. The default HTTP port is 1581.

You must open the two TCP/IP ports for the remote workstation client using the ***webports*** option in the remote workstation’s option file. Values for the ***webports*** are required. If you do not specify the values for the ***webports*** option, the default zero (0) causes TCP/IP to randomly assign two free port numbers. See “Webports” on page 229 for more information about the ***webports*** option.

To use the administrative Web interface for a server across a firewall, you must open the port that is the HTTP port for the server using the ***httpport*** option in the server options file. The default HTTP port is 1580.

In an enterprise environment, we strongly recommend that you use the Tivoli Storage Manager Secure Web Administrator Proxy for Web administration of the Tivoli Storage Manager server. Install the proxy on a Web server that sits on the

firewall so that the Web server can access resources on both sides of the firewall (this is sometimes called the *demilitarized zone*). When you set up the proxy, you can use it to administer any Tivoli Storage Manager server at Version 3.7 or higher. For more information on how to install and use the proxy, see the appendix about the Web proxy in the Tivoli Storage Manager Quick Start manual. You can also increase security in this environment by enabling HTTPS services (also called secure socket layer or SSL) on the Web server where you install the proxy. Check your Web server documentation for information on how to set this up.

When using Tivoli Storage Manager across a firewall, please consider the following:

- To use the Web client to connect to a client across a firewall, the Web client and the backup-archive client must be Version 4.1.2 or later.
- To enable the backup-archive client, command line admin client, and the scheduler (running in polling mode) to run outside a firewall, the port specified by the server option ***tcpport*** (default 1500) must be opened by the firewall administrator.

  Note: Tivoli Storage Manager does not support the scheduler running in *prompted* mode outside a firewall. In *prompted* mode the Tivoli Storage Manager server needs to contact the client. In order to do this, some software must be installed on the Tivoli Storage Manager server to route the request through the firewall. This software routes the server request through a sock port on the firewall. This is typically called *socksifing* a system. Proxies are not supported, since they only route a few types of communication protocols (HTTP, FTP, GOPHER) and Tivoli Storage Manager is not one of these communication protocols that are routed. It is important to note that the client creates a new connection to the Tivoli Storage Manager server when prompted. This means that the firewall configuration discussed above must be in place.
- The server cannot log events to a Tivoli Enterprise Console server across a firewall.

Starting the Client Scheduler Automatically

Root User

You can start the client scheduler automatically when you start your workstation. If the administrator has defined schedules for your node, starting the client scheduler permits you to automatically back up your workstation (or perform other scheduled actions). See Chapter 7, “Automating Tasks” on page 91 for more information about the client scheduler.

You can also use the Tivoli Storage Manager Client Acceptor service to manage the scheduler. See “Managing the Client Scheduler Using the Client Acceptor Daemon” on page 93 for more information.

Changing Your Password

Your administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. Contact your administrator if you do not know your password.

If you are using passwords, you should change them regularly to restrict access to your data.

To change your password from the GUI:

1. From the main window, open the **Utilities** menu and select **Change password**.
2. Enter your current and new passwords, and enter your new password again in the **Verify password** field.
3. Click **Change**.

To change your password from the command line, enter:

```
dsmc set password
```

Then, enter your old and new passwords.

A Tivoli Storage Manager password can be up to 63 characters. Valid characters are:

Character	Description
A–Z	Any letter; A through Z, upper or lower case
0–9	Any number; 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

A password is not case sensitive. See “Password” on page 184 for additional password information.

The following are additional password information sources:
- “Starting the Client Scheduler Automatically” on page 48
- “Starting: Additional Considerations” on page 44
- “Password” on page 184
- “Set Password” on page 333

Sorting File Lists

You can sort a list of files by various attributes, such as name, directory, size, or modification date. Sorting files by the last backup date can be useful in determining what date and time to use for the point-in-time function (see “Performing Point-in-Time Restores” on page 77).

To sort a file list, select one of the **Sort by** items from the **View** menu bar. You can also click the appropriate column heading in the **File List** box.

The **Show active/inactive files** menu option controls whether to display both active and inactive backup versions of files. An *active* file is the most recent backup version of a file that existed on your workstation when you ran your last backup. All other backup versions of that file are called *inactive*. Only active backup versions of files display during a session, unless you select the **Show active/inactive files** menu option. If you delete the file from your workstation, the active version becomes inactive the next time you run an incremental backup.

On the command line client, you can use the ***inactive*** and ***pick*** options with query and restore commands to display both active and inactive objects. See “Inactive” on page 250 and “Pick” on page 259 for more information.

Displaying Online Help

You can display online help in any of the following ways:
- Place the cursor on an option or field of interest and press F1.
- Open the **Help** menu .
- Click the **Help** button in the current window.
- On the Command Line, enter the **dsmc help** command.

Ending a Session

You can end a Tivoli Storage Manager client session in any one of the following ways:
- Open the **File** menu and select **Exit**.
- Double-click the **System** menu (the button in the upper left corner on the title bar).
- Open the **System** menu and select **Close**.
- On the Command Line, enter **quit** (when working in interactive mode).

To end a Web client session, open a different URL, or close the browser.

Online Forum

To participate in online user discussions of Tivoli Storage Manager, you can subscribe to an Internet Listserv forum. This is not officially supported by Tivoli Storage Manager, but support people do participate in the discussions, along with other users.

You can subscribe by sending a note to **Listserv@vm.marist.edu** that contains:

```
subscribe adsm-l yourfirstname yourlastname
```

Posts can then be sent to **adsm-l@vm.marist.edu**.

Other Sources of Online Help

An anonymous FTP server is available where you can find PTF maintenance and other Tivoli Storage Manager-related materials. Four other anonymous servers are unofficially maintained by non-IBM volunteers. These servers are:

```
ftp.software.ibm.com/storage (primary - IBM)
ftp.rz.uni-karlsruhe.de (mirror - Germany)
ftp.wu-wien.ac.at (mirror - Austria)
ftp.cac.psu.edu (mirror - Pennsylvania)
sunsite.unc.edu/pub/packages (mirror - North Carolina)
```

If you have the required username and password, you can get maintenance information from the Tivoli Storage Manager support page at:

```
http://www.tivoli.com/support/storage_mgr/tivolimain.html
```

Contacting Customer Support

For support for this or any Tivoli product, you can contact Tivoli Customer Support in one of the following ways:

- Visit the Tivoli Storage Manager technical support Web site at:

  ```
  http://www.tivoli.com/support/storage_mgr/tivolimain.html
  ```

- Submit a problem management record (PMR) electronically at **IBMSERV/IBMLINK**. You can access the IBMLINK from the IBM Web site at:

http://www.ibmlink.ibm.com

- Submit a problem management record (PMR) electronically from the Tivoli Web site at:

  http://www.tivoli.com/support

- Send e-mail to: **support@tivoli.com**.

Customers in the United States can also call 1-800-TIVOLI8 (1-800-848-6548). For product numbers 5697-TS9, 5697-DRS or 5697-DPM call 1-800-237-5511.

International customers should consult the Tivoli Web site for customer support telephone numbers.

If you have a problem with any Tivoli product, you can contact Tivoli Customer Support. See the Tivoli Customer Support Handbook at the following Web site:

http://www.tivoli.com/support/handbook

When you contact Tivoli Customer Support, be prepared to provide identification information for your company so that support personnel can readily assist you. Company identification information may also be needed to access various online services available on the Web site.

The Tivoli Customer Support Web site (http://www.tivoli.com/support/) offers a guide to support services (the Customer Support Handbook); frequently asked questions (FAQs); and technical information, including release notes, user's guides, redbooks, and white papers. You can access Tivoli publications online at:

http://www.tivoli.com/support/documents/

The documentation for some products is available in PDF and HTML formats. Translated documents are also available for some products.

To access most of the documentation, you need an ID and a password. To obtain an ID for use on the support Web site, go to:

http://www.tivoli.com/support/getting/

You can order documentation by e-mail at **swdist@tivoli.com**. Please provide the publication number, part number, or order number of the desired document. Alternatively, you can provide the document title, version number, and date of publication.

We are very interested in hearing about your experience with Tivoli products and documentation. We also welcome your suggestions for improvements. If you have comments or suggestions about our documentation, please contact us in one of the following ways:

- Send e-mail to **pubs@tivoli.com**.
- Complete our customer feedback survey at:

  http://www.tivoli.com/support/survey/

Chapter 4. Backing Up Files and Directories

Use Tivoli Storage Manager to maintain a set of backup versions of your file system or raw logical volumes on your workstation. You can recover these older file versions in the event your current files are lost or damaged. This chapter covers different ways to back up files, how to restore the files, and the difference between backing up and archiving files.

All client backup and restore procedures in this chapter also apply to the Web client, except the following:

- Estimate
- View Policy Information
- Access Another User
- Searching and Filtering
- User Access List
- Preferences Editor

See "Starting a Web Client Session" on page 44 for information on starting the Web client.

Note: Files backed up or archived by an OS/390 UNIX backup-archive client can only be restored or retrieved by an OS/390 UNIX backup-archive client.

The following table identifies tasks described in this chapter:

Task	Page
Planning Your Backups	53
Using an Include-Exclude Options List to Control Processing	55
Backing Up Data Using the GUI	59
Backing up Data Using the Command Line	60
Performing an Image Backup	62
LAN-Free Data Movement	66
Backing Up NAS File Systems	66

Planning Your Backups

If you are a first-time user, or if you only back up files occasionally, you may wish to use Table 11 as a checklist of preliminary steps to consider before performing a backup.

Table 11. Preliminary Steps for Backing Up Files

___	Decide whether you want to back up files or archive them. See "Do You Want to Back Up or Archive Files?" on page 54 for more information.
___	Do you plan to use the AFS or DFS backup client, or both. See "Using the AFS/DFS Backup Clients" on page 54 for more information.
___	Do you need to exclude files from backup services? See "Using an Include-Exclude Options List to Control Processing" on page 55 for more information.

© Copyright IBM Corp. 1993, 2002

Table 11. Preliminary Steps for Backing Up Files (continued)

___	Decide what type of backup you want according to your needs. See the following sections for more information: "Full Incremental Backup" on page 56, "Incremental-By-Date Backup" on page 57, and "Full Incremental versus Partial Incremental, Incremental-by-date Backups" on page 57
___	If you are performing an image backup, ensure that you have accounted for unique considerations. See "Performing an Image Backup" on page 62 for more information.
___	For further backup considerations, see "Backup: Additional Considerations" on page 66.

Do You Want to Back Up or Archive Files?

When the backup-archive client backs up or archives a file, it sends a copy of the file and its associated attributes to the server; however, backups and archives have different goals.

Backups protect against file damage. The server maintains a sequence of backup versions for each file that you back up, and older versions are deleted as newer versions are made. The number of backup versions the server maintains is set by your administrator.

Note: If you need to frequently create archives for the same data, consider using instant archives (backup sets) instead. Frequent archive operations can create a large amount of metadata in the server database increasing database growth and decreasing performance for operations such as expiration. See "Restoring Data from a Backup Set" on page 79 for more information on how backup sets can be generated and restored.

Archive copies are more permanent. They maintain a file in a particular state indefinitely, (although your administrator can limit how long archives are kept). The server can store an unlimited number of archive versions of a file. Archives are useful if you need to go back to a particular version of your files, or you want to delete a file from your workstation and retrieve it at a later time, if necessary. For example, you might need to save spreadsheets for tax purposes, but because you are not using them, you do not want to leave them on your workstation. See Chapter 6, "Archiving and Retrieving Files" on page 85 for more information about archiving and retrieving files.

Use backups to protect against unforeseen damage to your files, and use archives for maintaining more permanent versions of your files.

Using the AFS/DFS Backup Clients

The AFS/DFS backup clients are available on AIX workstations. Tivoli Storage Manager includes executable files for the graphical user interface and the command-line interface in non-AFS/DFS, AFS, and DFS versions.

If you perform a command-line backup of AFS or DFS files using the non-AFS/DFS versions, Tivoli Storage Manager backs up the files and saves standard UNIX access permissions and extended permissions, but does not back up AFS or DFS access control lists for directories. If you want to back up AFS or

DFS access control lists, or to recognize AFS or DFS virtual mount points, you must use the AFS or DFS versions of the executable files.

For more information, please see Appendix A, "The AFS and DFS File Backup Clients" on page 335.

Using an Include-Exclude Options List to Control Processing

There may be files on your file systems that you do not want to back up. These files may be core files, local caches of network file systems, operating system or application files that could be easily recovered by reinstalling the program, or any other files that you could easily rebuild.

An Authorized User on your workstation can use the ***exclude*** and ***include*** options in your include-exclude options list to specify which files to exclude from backup processing.

Tivoli Storage Manager uses the include-exclude options file for incremental and selective backups and backs up any file that is not explicitly excluded. You do not need to use an ***include*** option to include specific files unless those files are in a directory you want to exclude.

You can also specify the ***include*** and ***exclude*** options in the client system options file `dsm.sys`. For more information on creating an include-exclude options file, see "Creating an Include-Exclude List (Optional)" on page 29.

Encryption

You can encrypt the data that is sent to the server during a backup or archive operation using standard DES 56-bit encryption. Files are selected for encryption using ***include.encrypt*** and ***exclude.encrypt*** processing. By default, files are not encrypted unless they are explicitly included using the ***include.encrypt*** option. For more information about the ***exclude.encrypt*** option, see "Exclude Options" on page 152. For more information about the ***include.encrypt*** option, see "Include Options" on page 163.

To encrypt file data, you must select an encryption key password, which Tivoli Storage Manager uses to generate the encryption key for encrypting and decrypting the file data. Store the encryption key password for later use. You can specify whether to save the encryption key password in a file named TSM.PWD by using the ***encryptkey*** option. While restoring the encrypted file, Tivoli Storage Manager will prompt you for the key password to decrypt the file in the following cases:

- If the ***encryptkey*** option is set to `Prompt`.
- If the key supplied by the user in the above case does not match.
- If the ***encryptkey*** option is set to `Save` and the locally saved key password does not match the encrypted file.

For more information about this option, see "Encryptkey" on page 148.

Backing Up Files and Directories

Your administrator might have set up schedules to automatically back up files on your workstation. See Chapter 7, "Automating Tasks" on page 91 for information on checking and running the schedules available to you. The following sections discuss how to back up files without using a schedule.

There are two types of incremental backup: ***full incremental*** and ***partial incremental***.

Full Incremental Backup

The first time you run a full incremental backups, Tivoli Storage Manager backs up all of the files and directories on the file systems you specify. This process can take a long time if you have several files to back up. Successive full incremental backups will only back up new and changed files. This allows the backup server to maintain current versions of your workstation files, without having to waste time or space by backing up files that already exist in server storage. Depending on your storage management policies, the server may keep more than one version of your files in storage. The most recently backed up files are active backup versions. Older copies of your backed up files are inactive versions. However, if you delete a file from your workstation, the backup server will not maintain an active backup version of that file. If you need to retrieve a file you have deleted, you will need to access the backup server's inactive file versions. See Chapter 8, "Understanding Storage Management Policies" on page 97 for more information about storage management polices.

To perform a full incremental backup using the client GUI, select the ***Incremental (complete)*** option from the type of backup pull-down menu on the backup window or use the **incremental** command on dsmc prompt. Specify file systems, directory trees, or individual files to include in the backup.

During an incremental backup, the client queries the server to determine the exact state of your files since last incremental backup. The client uses this information to:

- Back up new files
- Back up files whose contents changed since the last backup. The client considers a file changed if any of the following attributes changed since the last backup:
  - File size
  - Date or time of last modification
  - Access Control List

  If *only* the following items change, they are updated without causing the entire file to be backed up to the server:
  - File owner
  - File permissions
  - Last access time
  - Inode
  - Group ID
- Expire backup versions of files on the server that do not have corresponding files on the workstation. The result is that files which no longer exist on your workstation will not have active backup versions on the server.
- Rebind backup versions to management classes if you change management class assignments, even if you do not back up the file.

Attention: If a file's modification timestamp changes, it will be backed up during the next full incremental backup. The directories in the path that contain the file are also backed up, unless they already exist on the server. A directory that already exists on the server is only backed up again if its permissions or time stamp change. Directories count in the number of objects backed up. To exclude directories from backup, use the ***exclude.dir*** option. For more about ***exclude.dir***, see "Exclude Options" on page 152.

Understanding Which Files are Backed Up

When you requst a backup, Tivoli Storage Manager backs up a file if all of the follwing requirements are met:

- You do not exclude the file backup in your include-exclude list. If you do not have an include-exclude list, all files will be candidates for backup.
- The selected management class contains a backup copy group. See Chapter 7, "Automating Tasks" on page 91 for more information on management classes and backup copy groups.
- The file meets the serialization requirements defined in the backup copy group. If serialization is *static* or *shared static*, and the file is in use during back up, the backup does not occur. See "Using Management Classes and Copy Groups" on page 97 for more information.
- The file meets the mode requirements defined in the backup copy group. If the mode is *modified*, the file must have changed since the last backup. If the mode is *absolute*, the file can be backed up even if it does not change. See "Using Management Classes and Copy Groups" on page 97 for more information.
- The file meets the frequency requirements defined in the backup copy group. The specified minimum number of days since the last backup must elapse before a file is backed up. Frequency is ignored for partial incremental backups. See "Using Management Classes and Copy Groups" on page 97 for more information.

Incremental-By-Date Backup

For a disk or volume to be eligible for incremental-by-date backups, you must first perform a full incremental backup of that entire disk or volume. Running an incremental backup of only a directory branch or individual file will will not make the disk or volume eligible for incremental-by-date backups.

To perform an incremental-by date backup using the GUI, select the ***Incremental (date only)*** option from the *type of backup* pull-down menu or use the ***incrbydate*** option with the **incremental** command.

The client backs up only new and changed files with a modification date later than the date of the last incremental backup stored at the server, unless you exclude the file from backup services. Files added at the client after the last incremental backup, but with a modification date earlier than the last incremental, are not backed up. The directories in the path that contain the file are also backed up, unless they already exist on the server. A directory that already exists on the server is only backed up again if its modification timestamp changes. The files under the directory are also backed up even if their modification timestamps have not changed.

If you run an incremental-by-date backup of the whole file system, the server updates the date and time of the last incremental. If you perform an incremental-by-date backup on only part of a file system, the server does not update the date of the last full incremental. In that case, the next incremental-by-date backup will back up these files again.

Full Incremental versus Partial Incremental, Incremental-by-date Backups

Full incremental, partial incremental, and incremental-by-date all back up new and changed files. An incremental-by-date takes less time to process than a full incremental and requires less memory. A full incremental and an

incremental-by-date backup may not place exactly the same backup files into server storage because the incremental-by-date backup:

- Does not expire backup versions of files that you delete from the workstation.
- Does not rebind backup versions to a new management class if you change the management class.
- Does not back up files with attributes that change, unless the modification dates and times also change.
- Ignores the copy group frequency attribute of management classes. (Journal-based backups also ignore this attribute.)

Selective Backup

Use a selective backup when you want to back up specific files or directories regardless of whether a current copy of those files exists on the server. Incremental backups are generally part of an automated system to back up entire file systems. In contrast, selective backups allow you to manually select a set of files to backup regardless of whether they have changed since your last incremental backup.

To perform a selective backup using the client GUI, see "Backing Up Data Using the GUI" on page 59 for more information.

Use the **selective** command to perform a selective backup from the client command line. See "Selective" on page 329 for more information.

Unlike incremental backups, a selective backup:

- Does not cause the server to update the date and time of the last incremental.
- Backs up directory and file entries even if their modification timestamp or permissions have not changed.

Saving Access Permissions

When you back up your files, Tivoli Storage Manager also saves standard UNIX access permissions assigned to the files. Depending on your operating system, it also saves extended permissions. For example, for files on an AIX workstation, Tivoli Storage Manager saves access control lists.

If you use the AFS or DFS versions of the **dsm** and **dsmc** commands (**dsmafs** and **dsmcafs** for AFS, **dsmdfs** and **dsmcdfs** for DFS) to back up AFS or DFS files (on an AIX workstation only), Tivoli Storage Manager also saves the access control lists that exist for each AFS or DFS directory. If you perform a command line backup of AFS or DFS files using the non-AFS/DFS versions, Tivoli Storage Manager backs up the files and standard UNIX access permissions, but does not save the AFS or DFS access control lists for directories. See "Using the AFS/DFS Backup Clients" on page 54 for more information.

Note: It is possible for an Authorized User to back up files for another user, but this should not cause ownership conflicts. The backup server will properly record that the file belongs to the original owner. The Authorized User does not need to grant the other user access to the backup versions.

Setting a Virtual Mount Point

If you are an Authorized User and you want back up files beginning with a specific directory within a file system, you can define that directory as a virtual mount point (see "Virtualmountpoint" on page 225).

Defining a virtual mount point within a file system provides a direct path to the files you want to back up, thus saving processing time. It is more efficient than defining the file system with the ***domain*** option and then using an ***exclude*** option to exclude the files you do not want to back up. It also allows you to store backups and archives for specific directories in separate storage file spaces.

Note: The backup-archive client does not recognize AFS/DFS volume mount points. You must install the AFS/DFS client. For more information about using the AFS/DFS backup-archive clients, see Appendix A, "The AFS and DFS File Backup Clients" on page 335.

Estimating Backup Processing Time

You can use the **Estimate** function to estimate the amount of time it takes to process files and directories. The estimated time is a rough calculation of the time required to transfer your data and is based on previous transfers of data between your workstation and the current server. The actual transfer time could be longer or shorter than the estimate due to factors like network traffic, system load on your workstation, or system load on the server.

Since the Estimated Transfer Time is based on previous backup transfer rates, you must run at least one backup operation first. Note that the estimate function does not take into account whether or not files are excluded from backup. The assumption made by the estimation algorithm is that all the files selected will be sent to the server. The Estimated Transfer Time field reads N/A if no files are sent to or from the current server.

Note: During installation, Tivoli Storage Manager creates the `.adsmrc` file to record statistics from the backup-archive client estimate function. The `.adsmrc` file resides in the directory named in the `$HOME` environment variable.

Backing Up Data Using the GUI

You can back up specific files, a group of files with similar names, or entire directories. You can locate the files you want to back up by searching or filtering. Filtering displays only the files matching the filter criteria for your backup.

1. Click **Backup files and directories** from the main window. The Backup window appears.
2. Expand the directory tree. Click on the selection boxes next to the object or objects you want to back up. To search or filter files, click the **Search** icon on the tool bar.
   To search:
   a. Enter your search criteria in the Find Files (Backup) window.
   b. Click the **Search** button. The Matching Files (Backup) window appears.
   c. Click the selection boxes next to the files you want to back up and close the Matching Files (Backup) window.

   To filter:
   1) Enter your filter criteria in the Find Files (Backup) window.
   2) Click the **Filter** button. The Backup window displays the filtered files.
   3) Click the selection boxes next to the filtered files or directories you want to back up.
3. Select one of the following backup types from the pull-down menu:
   - To run an incremental backup, click **Incremental (complete)**.
   - To run an incremental-by-date backup, click **Incremental (date only)**.
   - To run a selective backup, click **Always backup**.

4. To modify specific backup options, click the **Options** button located to the right of the **Backup** button. The options you select are effective during the current session *only*.
5. Click **Backup**. The Backup **Task List** window displays the backup processing status.

To perform an automatic incremental backup of your default domain, select **Actions→ Backup Domain**. Your default domain is set with the ***domain*** option in your client user options file (see "Domain" on page 139). If you do not have the ***domain*** option set, the default domain is *all local file systems*.

Backing up Data Using the Command Line

You can use the **selective** or **incremental** command to perform a backup. When the **incremental** and **selective** commands complete, Tivoli Storage Manager displays processing statistics similar to those shown in the GUI **Backup Report** window. These statistics also display in the schedule log for scheduled commands. See "Incremental" on page 293 and "Selective" on page 329 for more information.

Selective: The **selective** command backs up specific files. Use wildcards to back up more than one file at a time. If you back up a directory, you can use the ***subdir=yes*** option to include all the subdirectories under that directory in the backup. For example, to back up all files in the `/home/monnett/proj` directory and its subdirectories, enter:

```
dsmc selective /home/monnett/proj/ -subdir=yes
```

If you specify ***subdir=yes*** when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

If a subdirectory is a mounted file system, Tivoli Storage Manager does not back up the files in that subdirectory when you use the ***subdir=yes*** option.

You can use more than one file specification on the **selective** command. For example, to back up the `/home/monnett/h1.doc` and `/home/monnett/test.doc` files, enter:

```
dsmc selective /home/monnett/h1.doc /home/monnett/test.doc
```

Incremental: You can run an incremental backup from the command line using the **incremental** command. For example, to back up the `/home` file system, enter:

```
dsmc incremental /home
```

If you do not select the file systems to back up, Tivoli Storage Manager uses your default domain. Add file systems to the default domain with the ***domain*** option. For example, if your default domain contains file systems `/home` and `/usr`, back up those file systems plus the `/mfg` file system using:

```
dsmc incremental -domain=/mfg
```

You can also perform an incremental backup on selected parts of any file system. For example, to do an incremental backup on your home directory and all its subdirectories and files, enter this command:

```
dsmc incremental $HOME/ -subdir=yes
```

To start an incremental-by-date, add the ***incrbydate*** option:

```
dsmc incremental -incrbydate
```

Displaying Backup Processing Status

During a backup, by default Tivoli Storage Manager displays the status of each file it attempts to back up. Tivoli Storage Manager reports the file's size, path, file name, total number of bytes transferred, and whether the backup attempt was successful. Similar statistics are produced by the **selective** and **archive** commands. These also display in the `dsmsched.log` file for scheduled commands.

If you have set the ***resourceutilization*** option, Tivoli Storage Manager attempts to improve performance and load balancing by using multiple sessions when it backs up a file space or other set of files.

The Web client and backup-archive client GUI provide a **Task List** window that displays information about files during processing. When a task completes, a **Backup Report** window displays processing details. Click the **Help** button in the Backup Report window for context help.

The command line displays similar information. On the backup-archive command line the name of each file displays after it is sent to the server. The progress indicator shows overall progress. Informational messages may display as follows:

- `Directory-->`. Indicates the directory that you back up.
- `Normal File-->`. Any file that is not a directory, symbolic link or special file.
- `Special File-->`. Special files define devices for the system or temporary files created by processes. There are three basic types of special files: FIFO (first-in, first-out), block, and character. FIFO files are also called pipes. Pipes are created by one process to temporarily allow communication with another process.These files cease to exist when the first process finishes. Block and character files define devices. Tivoli Storage Manager processes only device and named pipe special files. Socket special files are not processed.
- `Symbolic Link-->`. Indicates that Tivoli Storage Manager backs up a symbolic link.
- `Updating-->`. Indicates that only the file meta data is sent, if file attributes change and not the data itself.
- `Expiring-->`. Indicates an object (file or directory) on the server that no longer exists on the client is expired and made inactive on the server.
- `Total number of objects inspected.`
- `Total number of objects backed up.`
- `Total number of objects updated.` These are files whose attributes, such as file owner or file permissions, have changed.
- `Total number of objects rebound.` See "Binding and Rebinding Management Classes to Files" on page 104 for more information.
- `Total number of objects deleted.` This is a count of the objects deleted from the client workstation after being successfully backed up to the server. The count is zero for all backup commands.
- `Total number of objects expired.` See "Full Incremental Backup" on page 56 for more information.
- `Total number of objects failed.` Objects can fail for several reasons. Check the `dsmerror.log` for details.
- `Data transfer time.` The total time to transfer data across the network. Transfer statistics may not match the file statistics if the operation was retried due to a communications failure or session loss. The transfer statistics display the bytes attempted to be transferred across all command attempts.

- `Network data transfer rate.` The average rate at which the network transfers data between the client and the server. This is calculated by dividing the total number of bytes transferred by the time to transfer the data over the network. The time it takes to process objects is not included in the network transfer rate. Therefore, the network transfer rate is higher than the aggregate transfer rate.
- `Aggregate data transfer rate.` The average rate at which Tivoli Storage Manager and the network transfer data between the client and the server. This is calculated by dividing the total number of bytes transferred by the time that elapses from the beginning to the end of the process. Both Tivoli Storage Manager processing and network time are included in the aggregate transfer rate. Therefore, the aggregate transfer rate is lower than the network transfer rate.

  Note: On occasion, the aggregate data transfer rate may be higher than the network data transfer rate. This is because the backup-archive client can have multiple simultaneous sessions with the backup server. When multiple sessions are open during backup, the data transfer time represents the sum of the times reported by all sessions. In this case, aggregate data transfer time is mistakenly reported as higher. However, when running with a single session, the aggregate data transfer rate should always be reported as lower than the network data transfer rate.
- `Objects compressed by.` Specifies the number of file-data bytes sent over the net divided by the original size of the file on disk. For example, if the net data-bytes are 10K and the file is 100K, then Objects compressed by: == (1 - (10240/102400)) x 100 == 90%
- `Elapsed processing time.` The active processing time to complete a command. This is calculated by subtracting the starting time of a command process from the ending time of the completed command process.
- `Total number of bytes transferred.`
- `LanFree bytes transferred.`

Performing an Image Backup

Root User

From your local workstation, you can back up one or more volumes or raw logical volumes as a single object (image backup) on your system.

An image backup provides the following benefits:

- Improves the speed with which Tivoli Storage Manager restores file systems containing many small files.
- Conserves resources on the server during backups since only one entry is required for the image.
- Provides a point-in-time picture of your logical volume, which may be useful if your enterprise needs to recall that information. For special considerations regarding point-in-time restores, see "Backup Image" on page 280.
- Restores a corrupt file system or raw logical volume. Data is restored to the same state it was when the last logical volume backup was performed.

The traditional *offline* image backup prevents access to the volume by other system applications during the operation. Use the ***imagetype***=*dynamic* option to back up the volume *as is* without remounting it read-only. Corruption of the backup may occur if applications write to the volume while the backup is in progress. In this case, run **chdsk** after a restore. This option replaces the dependency on the Copy

Serialization value in the management class to perform an image backup without unmounting and remounting the file system read-only. See “Imagetype” on page 161 for more information.

For Linux86 *only*: By default, Tivoli Storage Manager performs an *online* image backup of file systems residing on a logical volume created by the Linux Logical Volume Manager during which the volume is available to other system applications.

Note:

You can use the ***imagetype*** option with the **backup image** command or the ***include.image*** option to specify whether to perform an offline or online image backup. See “Imagetype” on page 161 for more information.

Before You Perform an Image Backup

Before you perform an image backup, please consider the following:

- *For offline image backups only*: Ensure that no other application is using the volume when you run an offline image backup. The client will lock the volume, so no other applications can use it, to ensure a consistent image. The volume remains mounted but unavailable. If the volume is in use when the client attempts to lock the volume, the backup will fail.

  If the client cannot lock a volume because it is in use, and online image backup is not available, you can use an ***include.image*** statement to force the client to continue the image backup without unmounting and remounting the volume in read-only mode. Set the ***imagetype*** option to *dynamic* in the ***include.image*** statement. The backup may be corrupted if applications write to the volume while the backup is in progress. This may be corrected by running **chkdsk** after a restore to fix any corrupted blocks. See “Include Options” on page 163 for more information.

  Important: If a mounted file system has nested mount points, unmount them before attempting a backup. Otherwise, Tivoli Storage Manager will be unable to unmount the volume.

  We recommend that you *do not* include system files in an image backup because file systems being actively used cannot be unmounted.
- You can assign a management class to manage the volume image. If you do not assign a management class, the default management class is used for the image. To assign a management class, use the ***include.image*** option. See “Include Options” on page 163 for more information. See Chapter 8, “Understanding Storage Management Policies” on page 97 for more information about management classes.
- You can exclude a volume from image backup using the ***exclude.image*** option. See “Exclude Options” on page 152 for more information.
- Online image backup also requires a Version 5.1 Tivoli Storage Manager server.

Volume Device Type Support for an Image Backup: The following table lists devices supported by the **backup image** command. A raw device might be a disk slice, a partition, or a logical volume.

Table 12. Volume Device Type Support for an Image Backup

Logical Volume Manager	Raw Device Types	Sample Device Name	Backup Image Command Support
AIX Logical Volume Mgr	Logical Volumes	/dev/lv00	AIX, AIX 5L

Table 12. Volume Device Type Support for an Image Backup (continued)

Logical Volume Manager	Raw Device Types	Sample Device Name	Backup Image Command Support
Sun Solstice Volume Mgr	Meta Devices	/dev/md/dsk/dl	Solaris
Veritas Volume Mgr	Logical Volumes	/dev/vx/dsk/rootdg/vol01	HP-UX, Solaris
Raw Disk	Partitions	/dev/hda1, /dev/sda3	Linux86
Linux Logical Volume Mgr	Logical Volumes	/dev/myvolgroup/myvolume	Linux86
Raw Disk	Disk Slices	/dev/dsk/c0tld0s0	Solaris

The client must support the raw device type on the specific platform in order to perform an image backup of a raw device. If you want to perform an image backup for a file system mounted on a raw device, the raw device must be supported. Remember to specify raw devices by their block device name.

Note: You should not back up disk slices containing cylinder 0 on Solaris because the volume table of contents (VTOC) will be overwritten after a restore.

Incremental-by-Date of Last Image Backup

You can perform an incremental-by date image backup to back up files that have changed since your last image backup. The following restrictions apply:

- The file system can have no previous full incremental backups produced by the **incremental** command.
- You can perform the backup only on formatted volumes; not on raw logical volumes.
- Incremental-by-date image backup does not inactivate files on the server; therefore, when you restore an image with the ***incremental*** option, files deleted after the original image backup will be present after the restore.
- If this is the first image backup for the file system, a full image backup is performed.

Performing an Image Backup Using Command Line Client

Use the **backup image** and **restore image** commands to perform offline or online image backup and restore operations on a single volume. See "Backup Image" on page 280 and "Restore Image" on page 321 for more information.

Use the ***mode*** option with the **backup image** command to perform an incremental-by-date image backup that backs up only new and changed files after the last full image backup. However, this only backs up files with a changed date, not files with changed permissions. See "Mode" on page 255 for more information.

You must assign a mount point for the volume on which you want to perform an image backup. Tivoli Storage Manager will not back up a volume without a mount point.

Performing an Image Backup from the GUI

To create an offline or online image backup of your file system or raw logical volume, perform the following steps:

1. Click on the **Backup files and directories** button in the Tivoli Storage Manager main window. The Backup window appears.

2. Expand the directory tree and select the objects you want to back up. To back up a raw logical volume, locate and expand the **RAW** directory tree object.
   - To perform an *offline* image backup, select **Image Backup** from the drop-down list.
   - To perform an *online* image backup, select **Image Snapshot Backup** from the drop-down list. (Linux only)
   - To perform an incremental-by-date image backup, select **Incremental Image (date only)** from the drop-down list.
3. Click **Backup**. The Backup **Task List** window displays the backup processing status. The Backup Report window displays a detailed status report.

Considerations:

- Running a full incremental backup after running file system backups and incremental file system backups will invalidate an image that you made.
- To modify specific backup options, click the **Options** button located to the right of the **Estimate** button. The options you select are effective during the current session *only*.
- If you want to estimate the amount of time it takes to process your files and directories, click the **Estimate** button. The Estimated Transfer Time field reads N/A if no files are sent to or from the current server.

Image Backup Example

The following is an example of how you can use image and incremental backups together:

	Client	Server
Monday	Files 1, 2 and 3 reside here.	An image backup is performed. (Assume a full incremental was also performed.)
Tuesday	File 4 is created.	Daily incremental is performed - including incremental for file 4.
Wednesday	File 2 is deleted; file 3 is changed.	Daily incremental is performed - including incremental for file 3.
Thursday	File 1 is deleted.	Daily incremental is performed.

Suppose you want to use the image created on Monday to restore your file system as it appeared just after Thursday's incremental backup. You would enter the following command:

```
restore image filespace -incremental -deletefiles
```

Tivoli Storage Manager would then use the following process:

1. The server sends the image backup to the client. This image replaces the current content of the target file space. The file system now contains files 1, 2 and 3. File 4 has been lost because it was not part of the original image.
2. Based on the information from the server about subsequent incremental backups, the client removes files 1 and 2.
3. The client restores file 4.
4. The client restores the latest version of file 3.

LAN-Free Data Movement

AIX, AIX 5L, HP-UX, and Solaris clients support LAN-free data movement, which shifts the movement of client data from the communications network to a storage area network (SAN). Shifting the client data movement from the communications network to a SAN decreases the load on the Tivoli Storage Manager server.

The SAN provides a path that allows you to backup, restore, archive, and retrieve data to and from a SAN-attached storage device. Client data moves over the SAN to the storage device via the Tivoli Storage Manager Storage Agent. The Tivoli Storage Manager Storage Agent must be installed on the same system as the client.

LAN-Free Prerequisites

To enable LAN-Free support, you must install and configure the Tivoli Storage Manager Managed System for SAN feature on the client workstation. For more information, refer to the following publications:

- *Tivoli Storage Manager for AIX Managed System for SAN Storage Agent User's Guide*, GC32-0771
- *Tivoli Storage Manager for Sun Solaris Managed System for SAN Storage Agent User's Guide*, GC32-0781
- *Tivoli Storage Manager for HP-UX Managed System for SAN Storage Agent User's Guide*, GC32-0727

LAN-Free Options

After installing and configuring the Tivoli Storage Manager Managed System for SAN feature on the client workstation, you can use the following options to enable LAN-Free data movement:

enablelanfree
Specifies whether to enable an available LAN-free path to SAN-attached storage device. See "Enablelanfree" on page 146 for more information.

lanfreecommmethod
Specifies a communication protocol between the client and the Storage Agent. See "Lanfreecommmethod" on page 167 for more information.

lanfreetcpport
Specifies the TCP/IP port number where the Storage Agent is listening. See "Lanfreetcpport" on page 170 for more information.

lanfreeshmport
Specifies the Shared Memory port number where the Storage Agent is listening. See "Lanfreeshmport" on page 169 for more information.

Backing Up NAS File Systems

Tivoli Storage Manager supports backup and restore of network attached storage (NAS) file system images to tape drives or libraries that are locally attached to NAS file servers. Tivoli Data Protection for NDMP enables backup and restore support on the Tivoli Storage Manager Windows NT, 2000, XP, and Windows.NET, AIX, and Solaris servers for NAS file servers from Network Appliance. *Tivoli Data Protection for NDMP is a separately priced and licensed product.* See Appendix C, "Backing Up NAS File Systems Using NDMP" on page 347 for more information.

Backup: Additional Considerations

This section includes topics related to incremental and selective backups. You do not need to understand this information to use Tivoli Storage Manager for basic work.

Understanding How Files are Stored

When you back up and archive files, Tivoli Storage Manager stores the backups and archives in a file space in storage that has the same name as the file system or virtual mount point from which the files originated.

For example, if you have a file system named /home, and you back up a file named doc1 in the /home/monnett directory, Tivoli Storage Manager stores the file in a file space named /home. If an Authorized User later defines /home/monnett as a virtual mount point, any files you back up from the /home/monnett directory, such as doc2, are stored in a file space named /home/monnett. If you enter this command:

```
dsmc query backup "/home/monnett/*"
```

Tivoli Storage Manager looks for files in the /home/monnett file space. It always looks for a file in the file space with the longest name that matches the file specification you include in a command. It locates the file named doc2 that was backed up after the virtual mount point was defined. However, it does not locate the file named doc1 because that file was backed up before the virtual mount point was defined and the backup was stored in the /home file space.

To list or restore the doc1 file using a command, you must explicitly specify the file space name by enclosing it in braces. For example:

```
dsmc query backup "{/home}/monnett/*"
dsmc restore {/home}/monnett/doc1
```

If the Authorized User subsequently removes the /home/monnett virtual mount point, and you then back up additional files in the /home/monnett directory, the backups are once again stored in the /home file space. For example, if you now back up a file named doc3 in the /home/monnett directory, it is stored in the /home file space. It is not stored in the existing /home/monnett file space.

However, because the /home/monnett file space already exists, when you try to query or restore the doc3 file, Tivoli Storage Manager looks for the file in the /home/monnett file space unless you specify the correct file space name. For example:

```
dsmc query backup "{/home}/monnett/*"
dsmc restore {/home}/monnett/doc2
```

Note: You must explicitly specify the file space name only when there can be more than one resolution to the file specification.

For example, if the following file spaces exist in storage:

```
/home
/home/monnett
/home/monnett/project1
/home/monnett/project1/planning
```

then enter:

```
dsmc query backup "/home/monnett/project1/planning/*"
```

Tivoli Storage Manager looks for files only in the /home/monnett/project1/planning file space, even if one or more of the other file spaces contains a path with the same name. But, when you enter one of the following:

```
dsmc query backup "{/home}/monnett/project1/planning/*"
dsmc query backup "{/home/monnett}/project1/planning/*"
dsmc query backup "{/home/monnett/project1}/planning/*"
```

Tivoli Storage Manager looks for files only in the /home file space, the /home/monnett file space, or the /home/monnett/project1 file space, depending on which form you use.

Which Files are Backed Up

When you request an incremental or selective backup, Tivoli Storage Manager backs up a file if all of the following requirements are met:

- The file is not excluded from backup in your include-exclude options list. If you do not have an include-exclude list, all files will process.
- The selected management class contains a backup copy group. See Chapter 7, "Automating Tasks" on page 91 for more information on management classes and backup copy groups.
- The file meets the copy serialization requirements defined in the backup copy group. If serialization is *static* or *shared static*, and the file is in use during back up, the backup does not occur.

When you perform an incremental backup of your files, Tivoli Storage Manager also checks the following:

- Mode requirements defined in the backup copy group. If the copy mode has a value of *modified*, the file must have changed since the last backup. If the copy mode has a value of *absolute*, the file can be backed up even if it has not changed.
- Frequency requirements defined in the backup copy group. The minimum number of days since the last backup must elapse before a file is backed up.

When you run an incremental or selective backup, Tivoli Storage Manager also backs up all directory information that is not already backed up. Directories are counted in the number of objects backed up.

How Special File Systems are Handled

Special file systems contain dynamic information generated by the operating system; they contain no data or files. The Tivoli Storage Manager client ignores special file systems and their contents. Special file systems include the following:

- the /proc file system on most of the UNIX platforms
- the /dev/fd file system on Solaris and SGI
- the /dev/pts on Linux

How Files are Assigned to Management Classes

Tivoli Storage Manager uses management classes to determine how to manage your backups on the server. Every time you back up a file, the file is assigned a management class. The management class used is either a default selected for you, or one assigned to the file by an Authorized User with an ***include*** option in the include-exclude options list. The selected management class must contain a backup copy group in order for the file to be backed up. See Chapter 7, "Automating Tasks" on page 91 and Chapter 8, "Understanding Storage Management Policies" on page 97 for more information on management classes, how an Authorized User assigns management classes to files, and storage management policies.

Understanding How Symbolic Links are Handled

A UNIX symbolic link is a file that contains a pointer to another file or directory. Tivoli Storage Manager handles symbolic links differently than it does regular files and directories. In some operations, such as a backup, only the path information that the symbolic link contains is backed up. In other operations, such as archive, the file to which the symbolic link points is archived, but under the name of the symbolic link. For more information on how symbolic links are handled during an archive operation, see "Archsymlinkasfile" on page 123.

Incremental backup
— When you run an incremental backup, Tivoli Storage Manager backs up only the path information to a file or directory to which a symbolic link points. The contents of the file or the contents of files in the directory are not backed up.

Selective backup
— When you run a selective backup on a symbolic link that points to a file, Tivoli Storage Manager backs up only the path information to that file. The contents of the file are not backed up.

Restore — When you restore a symbolic link that originally pointed to a file, the symbolic link is restored, whether or not the file it points to still exists. If you restore a symbolic link that originally pointed to a directory:

- Without the files in the directory (for example, `/home/gillis/symdir/`), and the symbolic link does not exist on your file system, nothing is returned.
- Along with the files in the directory (for example, `/home/gillis/symdir/*`), and the symbolic link does not exist on your file system, Tivoli Storage Manager builds the directory on your workstation and puts the files in that directory. If the ***subdir*** option is set to `yes`, Tivoli Storage Manager recursively restores all subdirectories of the directory.
- And the symbolic link already exists on your workstation, the result depends on how the ***followsymbolic*** option is set; if it is set to:

  Yes — The symbolic link is restored and overwrites the directory on your workstation. If the ***followsymbolic*** option is set to `yes`, a symbolic link can be used as a virtual mount point.

  No — Tivoli Storage Manager displays an error message. `No` is the default.

  Note: On UNIX systems, when a symbolic link is created its modification time is set to current system time and can not be changed. When restoring a symbolic link, its modification date and time is set to the date and time of the restore, not to the date and time of the symbolic link when it was backed up. As a result, Tivoli Storage Manager will back up the symbolic link again during the next incremental backup because its modification time changed since the last backup.

The following table shows symbolic link backup and restore functions along with the action taken:

Table 13. Symbolic Link Management Table for Backup and Restore

Function	Action Taken
Selective backup of a file.	Backs up the symbolic link only, the file is not backed up.
Selective backup of a directory.	Backs up the directory only, the symbolic link is not backed up.
Incremental backup with ***subdir***=*no*.	Backs up the symbolic links only, files and directories pointed to are not backed up.
Incremental backup with ***subdir***=*yes*.	Backs up the symbolic links and directories and files they point to.

Table 13. Symbolic Link Management Table for Backup and Restore (continued)

Function	Action Taken
Restore a symbolic link that points to a file.	The symbolic link is restored, regardless of whether the file the symbolic link points to still exists.
Restore a symbolic link that points to a directory.	The symbolic link is restored, regardless of whether the directory the symbolic link points to still exists.
Restore a symbolic link that points to a directory with ***subdir=yes***, the directory still exists.	The symbolic link and files in the directory and subdirectories are restored.
Restore a symbolic link that points to a directory with ***subdir=yes***, the directory and symbolic link no longer exist.	A directory is created in the directory in which the symbolic link resides and all files and subdirectories are restored to that directory; the symbolic link name is used as the new directory name.

Understanding How Hard Links are Handled

When you back up a file that is hard linked to another file, Tivoli Storage Manager stores both the link information and the data file on the server. If you back up two files that are hard linked to each other, Tivoli Storage Manager backs up the link information and only one copy of the data file.

When you restore a hard linked file, Tivoli Storage Manager attempts to reestablish the links. For example, if you had a hard linked pair of files, and only one of the hard-linked files was on your workstation, when you restore both files, they will be hard-linked together.

The one exception to this procedure occurs if you back up two files that are hard-linked together and then break the connection between them on your workstation. The two files then contain separate data files. If you restore the two files from the server, Tivoli Storage Manager will respect the current file system and not restore the hard link.

Problems can occur if you back up only one file of a set of hard-linked files. For example, files `texta` and `textb` are hard linked to each other. You back up `texta`, then edit `textb` and make some changes. If you restore `texta`, the changes you made to `textb` will be lost.

To ensure that hard-linked files remain synchronized, always back up all hard links at the same time and restore those same files together.

Understanding How NFS Hard and Soft Mounts are Handled

When Tivoli Storage Manager connects a backup-archive client to an NFS file system, you can use either a hard mount or a soft mount. Tivoli Storage Manager uses the ***nfstimeout*** option setting to determine how long to wait for an NFS system call to respond before timing out; this applies to hard and soft mounts. The default is 10 seconds.

You should be aware of the consequences of hard and soft mounts if the mount becomes stale (for example, if the server for the file system is not available).

Hard mount
— If the NFS file system is hard mounted, the NFS daemons will try repeatedly to contact the server. The NFS daemon retries will not time out,

will affect system performance, and you cannot interrupt them, but control will return to Tivoli Storage Manager when the ***nfstimeout*** value is reached.

Soft mount
— If the NFS file system is soft mounted, NFS will try repeatedly to contact the server until either:
- A connection is established
- The NFS retry threshold is met
- The ***nfstimeout*** value is reached

When one of these events occurs, control returns to the calling program.

Backing Up Opened Files

Tivoli Storage Manager looks for files that have changed between the start and the completion of the file's backup. Some files on your system may be in use, or open, when you try to back them up. Because an open file may change, a backup action might not reflect the correct contents of the file at a given time.

Consider if a file is important. Can you build the file again? If the file is not important, you may not want to back up the file. Or, if the file is important, a root user on your workstation can ensure the file is closed before back up.

If your backups run on a schedule, a root user can use the ***preschedulecmd*** option to enter a command to close the file. For example, if the open file is a database, use the database's **quiesce** command to shut down the database. A root user can use the ***postschedulecmd*** option to restart the application that uses the file after the backup completes. If you are not using a schedule for the backup, ensure that you close the application that uses the file before you start the backup.

Tivoli Storage Manager can back up the file even if it is open and gets changed during the backup. This is only useful if the file will be usable even if it changes during backup. To back up these files, assign the files a management class with the serialization *dynamic* or *shared dynamic*. See "Selecting a Management Class for Files" on page 102 and "Displaying Information about Management Classes and Copy Groups" on page 99 for information.

Using Wildcard Characters

You can use the operating system's wildcard characters in file specifications with Tivoli Storage Manager. These characters let you select groups of files that have similar names.

In a command, wildcard characters can only be used in the file name or extension. They cannot be used to specify destination files, file systems, or directories. When using wildcard characters in non-loop mode, as in

```
dsmc sel "/home/ledger.*"
```

enclose the parameter containing the asterisk in quotes to ensure the system does not interpret the wildcard character and produce unexpected results. Wildcard character information is covered in the following table.

* *(Asterisk)*	**Zero or more characters that match all files:**
***.cpp**	With an exe extension
hm*.*	Starting with hm, regardless of extension
hm*	Starting with hm, whether an extension exists or not

* *(Asterisk)*	**Zero or more characters that match all files:**
h*.	With an h somewhere in the file name, regardless of extension

? *(Question mark)*	**One character that matches all files with:**
?.cpp	The extension exe with one, and only one, character in the file name
hm?.cpp	Three-character names beginning with hm and that have the exe extension

* **?** *(Asterisk and question mark)*	**Asterisk and question mark combinations matching:**
??hm.*	All four-character file names ending in hm., no matter what extension they have

In a path name for a file specification, you cannot specify a directory whose name contains an asterisk (*) or a question mark (?). Tivoli Storage Manager will recognize those characters only as wildcard characters.

Chapter 5. Restoring Files and Directories

Use Tivoli Storage Manager to restore backup versions of specific files, a group of files with similar names, or entire directories. Select the files you want to restore using file specification (file path, name, and extension), a directory list, or a subdirectory path to a directory and its subdirectories.

Table 14.

Performing a GUI Restore	75
Performing a Command Line Restore	75
Performing Large Restore Operations	76
Performing Point-in-Time Restores	77
Restoring an Image	78
Restoring Data from a Backup Set	79
Authorizing Another User to Restore/Retrieve Your Files	81
Restoring or Retrieving Another User's Files	81
Restore or Retrieve Files to Another Workstation	82
Restoring a Disk In Case of Disk Loss	82
Deleting File Spaces	83

UNIX socket files are skipped during restore, including socket files that were backed up with earlier versions of Tivoli Storage Manager.

No Query Restore

When you enter an unrestricted wildcard source file specification on the **restore** command and do not specify any of the options: ***inactive***, ***latest***, ***pick***, ***fromdate***, or ***todate***, the client uses a different method for retrieving files and directories from the server. This method is called *no query restore* because instead of querying the server for each object to be restored, a single restore request is sent to the server. This request results in files and directories being returned directly from the server without further action by the client. The client merely accepts the data coming from the server and restores it to the destination named on the **restore** command.

An example of an unrestricted wildcard command would be:

```
/home/mydocs/1999/*
```

An example of a restricted wildcard command would be:

```
/home/mydocs/1999/sales.*
```

When the client uses this method, the restore session is treated differently. If the restore process is interrupted for any reason, such as a power outage or network failure, the server records the point at which the restore was interrupted. This record is known to the client as a *restartable restore*. It is possible to create more than one restartable restore session. Use the **query restore** command to find out if your client has any restartable restore sessions in the server database.

© Copyright IBM Corp. 1993, 2002

The existence of a restartable restore inhibits further backups of that file system until the restartable restore is completed. If you attempt to repeat the restore that was interrupted or try to back up the destination file space, the attempt will fail because the original restore was not completed. You can restart the restore at the point of interruption by entering the **restart restore** command, or you can delete the restartable restore using the **cancel restore** command. If you restart the interrupted restore, it will restart with the first transaction, which may consist of one or more files, not completely restored when the interruption occurred. Because of this, you may receive some replace prompts for files from the interrupted transaction which were already restored.

The differences between the standard restore process and the no query restore process are outlined below.

Standard Restore Process

1. The client queries the server for a list of files backed up for the client file space being restored.
2. The server sends a list of backed up files that match the restore criteria. If both active and inactive files are to be restored, information about all backed up files is sent to the client.
3. The list of files returned from the server is sorted in client memory to determine the file restore order and to minimize tape mounts required to perform the restore.
4. The client tells the server to restore file data and directory objects.
5. The directories and files to be restored are sent from the server to the client.

No Query Restore Process

1. The client tells the server that a no query restore is going to be performed and provides the server with details about file spaces, directories, and files.
2. The server sorts the data using an internal sort table which minimizes tape mounts.
3. The data to be restored is sent to the client. File and directory objects stored on disk are sent immediately since sorting for such data is not required before restoring it.

For more information on using the command line to begin restartable restores, see "Restore" on page 315. For help with performing restartable restores using a GUI, follow these steps:

1. Click **Help** from the Restore window.
2. Click **Restoring Backup Versions**
3. Click **Work with restartable restore sessions**.

Do You Want to Restore an Active or Inactive Backup?

Your administrator determines how many backup versions Tivoli Storage Manager maintains for each file on your workstation. Having multiple versions of a file permits you to restore older versions if the most recent backup is damaged. The most recent backup version is the *active* version. Any other backup version is an *inactive* version. Every time Tivoli Storage Manager backs up your files, it marks the new backup version as the active backup, and the last active backup becomes an inactive backup. When the maximum number of inactive versions is reached, Tivoli Storage Manager deletes the oldest inactive version.

To restore a backup version that is inactive, you must display both active and inactive versions by clicking on the **View** menu→ **Display active/inactive files** item. To display only the active versions (the default), click on the **View** menu→ **Display active files only** item. If you try to restore both an active and inactive version of a file at the same time, only the active version is restored.

To display active backup versions only, click **Display active files only** from the **View** menu.

Performing a GUI Restore

To restore backup versions of individual files or subdirectories:

1. Click **Restore files and directories to your system** from the main window. The Restore window appears.
2. Expand the directory tree. Select the selection boxes next to the files or directories you want to restore. To search or filter files, click the **Search** icon on the tool bar.
   To search:
   a. Enter your search criteria in the Find Files (Restore) window.
   b. Click the **Search** button. The Matching Files (Restore) window appears.
   c. Click the selection boxes next to the files you want to restore and close the Matching Files (Restore) window.

   To filter:
   1) Enter your filter criteria in the Find Files (Restore) window.
   2) Click the **Filter** button. The Restore window displays the filtered files.
   3) Click the selection boxes next to the filtered files or directories you want to restore.
3. To modify specific restore options, click the **Options** button. Any options you change are effective during the current session *only*.
4. Click **Restore**. The Restore Destination window appears. Enter the information in the Restore Destination window.
5. Click **Restore**. The Restore **Task List** window displays the restore processing status. Transfer statistics may not match the file statistics if the operation was retried due to a failure such as a communications failure or session loss. The transfer statistics will show the bytes attempted to be transferred across all command attempts.

Performing a Command Line Restore

Use the **restore** command to restore files. Indicate the file you want to restore and where you want to restore it. If you do not indicate a destination, the files are restored to their original location.

For example, to restore the `/home/monnett/h1.doc` file to its original directory, enter:

```
dsmc restore /home/monnett/h1.doc
```

To restore it under a new name, use:

```
dsmc restore /home/monnett/h1.doc /home/monnett/h2.doc
```

If the file you want to restore is not on your workstation, and you have run an incremental backup since deleting the file, there is no active backup of the file on the server. In this case, you need to use the ***latest*** option to tell the server to

restore the most recent backup version. If you do not want the most recent version, use the ***pick*** and ***inactive*** options to get a list of backups from which you can select.

For example, if you want to restore the latest version of the deleted file `/home/monnett/h1.doc`, enter:

```
dsmc restore /home/monnett/h1.doc -latest
```

Add the ***subdir***=*yes* option to the command if you need to restore the files in a directory and all of its subdirectories. For example, if you are recovering an entire file system (the `/home` file system in this case), you can restore all of the files using:

```
dsmc restore /home/ -subdir=yes
```

If you specify ***subdir***=*yes* when restoring a specific path and file, Tivoli Storage Manager recursively restores *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

Performing Large Restore Operations

If you need to restore a large number of files, you can get faster performance by using the **restore** command instead of the GUI. In addition, you can improve performance by entering multiple **restore** commands at one time.

For example, to restore all the files in your `/home` file system, enter:

```
dsmc restore /home/ -subdir=yes -replace=all -tapeprompt=no
```

However, if you enter multiple commands for the directories in the `/home` file space, you can can restore the files faster.

For example, you could enter these commands:

```
dsmc restore /home/monnett/ -subdir=yes -replace=all -tapeprompt=no
dsmc restore /home/gillis/ -subdir=yes -replace=all -tapeprompt=no
dsmc restore /home/stewart/ -subdir=yes -replace=all -tapeprompt=no
```

You can also use the ***quiet*** option with the **restore** commands to save processing time. However, you will not receive informational messages for individual files.

Note: If you already have the appropriate values set for the ***subdir***, ***replace***, ***tapeprompt***, and ***quiet*** options in your client user options file, you do not need to include those options in the commands.

When you enter multiple commands to restore your files, you must specify a unique part of the file space in each **restore** command. Be sure you do not use any overlapping file specifications in the commands.

To display a list of the directories in a file space, use the **query backup** command. For example:

```
dsmc query backup -dirsonly -subdir=no /usr/
```

As a general rule, you can enter from two to four **restore** commands at one time. The maximum number you can run at one time without degrading performance depends on factors such as how much memory you have and network utilization.

The speed at which you can restore the files also depends on how many tape drives are available on the server, and whether your administrator is using collocation to keep file spaces assigned to as few volumes as possible.

For example, if /home/monnett and /home/gillis are on the same tape, the restore for /home/gillis must wait until the restore for /home/monnett is complete. However, if /home/stewart is on a different tape, and there are at least two tape drives available, the restore for /home/stewart can begin at the same time as the restore for /home/monnett.

If your administrator is using collocation, the number of sequential access media mounts required for restore operations is also reduced.

Performing Point-in-Time Restores

Use a *point-in-time* restore to restore files to the state that existed at a specific date and time. A point-in-time restore can eliminate the effect of data corruption, or recover a basic configuration to a prior condition.

You can perform a point-in-time restore of a file space, directory, or file. You can also perform a point-in-time restore of image backups. For more information see "Backup Image" on page 280.

Perform incremental backups to support a point-in-time restore. During an incremental backup, the client notifies the server when files are deleted from a client file space or directory. Selective and incremental-by-date backups do not notify the server about deleted files. Run incremental backups at a frequency consistent with possible restore requirements.

If you request a point-in-time restore with a date and time that is prior to the oldest version maintained by the Tivoli Storage Manager server, the object is not restored to your system. Files which were deleted from you workstation prior to the point-in-time specified will not be restored.

Notes:

1. Your administrator must define copy group settings that maintain enough inactive versions of a file to guarantee that you can restore that file to a specific date and time. If enough versions are not maintained, Tivoli Storage Manager may not be able to restore all objects to the point-in-time you specify.
2. If you delete a file or directory, the next time you run an incremental backup, the active backup version becomes inactive and the oldest versions that exceed the number specified by the *versions data deleted* attribute of the management class are deleted. See Chapter 8, "Understanding Storage Management Policies" on page 97 for more information about the *versions data deleted* attribute.

When performing a point-in-time restore, consider the following:

- Tivoli Storage Manager restores file versions from the most recent backup before the specified point-in-time date. Ensure the point- in-time that you specify is not the same as the date and time this backup was performed.
- If the date and time you specify for the object you are trying to restore is earlier than the oldest version that exists on the server, Tivoli Storage Manager cannot restore that object.
- Point-in-time restore will restore files deleted from the client workstation after the point-in-time date but not files deleted before this date.
- Tivoli Storage Manager cannot restore a file created after the point-in-time date and time. When a point-in-time restore runs, files that were created on the client after the point-in-time date are not deleted.

To perform a point-in-time restore from the GUI client, use the following steps:

1. Click the **Restore files and directories to your system** button in the main window. The Restore window appears.
2. Click the **Point-in-Time** button from the Restore window. The Point in Time Restore window appears.
3. Select the **Use a Point-in-Time date during restore** selection box. Select the date and time and click **OK**. The point in time that you specified appears in the Point in Time display field in the Restore window.
4. Display the objects you want to restore. You can search for an object by name, filter the directory tree, or work with the directories in the directory tree.
5. Click the selection boxes next to the objects you want to restore.
6. Click the **Restore** button. The Restore Destination window displays. Enter the appropriate information.
7. Click the **Restore** button to start the restore. The Restore Task List window displays the restore processing status.

Note: If there are no backup versions of a directory for the point-in-time you specify, files within that directory are not restoreable from the GUI. However, you can restore these files from the command line. To ensure that you can view and restore all existing files from the GUI during a point-in-time restore, you must maintain the same number of backup versions for directories as days you are restoring back to.

You can start point-in-time restore from the command-line client using the ***pitdate*** and ***pittime*** options with the **query** and **restore** commands. For example, when you use the ***pitdate*** and ***pittime*** options with the **query backup** command, you establish the point-in-time for which file information is returned. When you use ***pitdate*** and ***pittime*** with the **restore** command, the date and time values you specify establish the point-in-time for which files are returned. If you specify pitdate without a pittime value, pittime defaults to 23:59:59. If you specify pittime without a pitdate value, it is ignored.

Restoring an Image

You can use the following procedure to restore an image of your file system or raw logical volume:

1. Click **Restore** from the main window. The Restore window appears.
2. Expand the directory tree.
3. Locate the object in the tree named **Image** and expand it. Click the selection box next to the image you want to restore.
4. To modify specific restore options, click the **Options** button located to the right of the **Estimate** button. Any options you change are effective during the current session *only*.
5. Click **Restore**. The Restore Destination window appears. The image can be restored to the volume with the drive letter or mount point from which it was originally backed up. Alternatively, a different volume can be chosen for the restore location.
6. Click the **Restore** button to begin the restore. The **Task List** window appears showing the progress of the restore. The Restore Report window displays a detailed status report.

When performing an image restore, consider the following:

- Restoring the image of a volume will restore the volume to the same state that it was in when you performed your last image backup. Be absolutely sure that you

need to restore an image, for it will replace your entire current file system or raw volume with the image on the server.

- Ensure that the file system or volume to which you are restoring the image is at least as large as the image that is being restored.
- The file system or volume you are restoring to does not have to be the same type as the original. The volume does not even have to be formatted. The image restore process will create the appropriately formatted file system for you.
- Ensure that the target volume of the restore is not in use. The client will lock the volume before starting the restore. The client will unlock the volume after the restore completes. If the volume is in use when the client attempts to lock the file system, the restore will fail.
- You cannot restore an image to where the Tivoli Storage Manager client program is installed.
- If you have run progressive incremental backups *and* image backups of your file system, you can perform an incremental image restore of the file system. The process restores individual files after the complete image is restored. The individual files restored are those backed up after the original image. Optionally, if files were deleted after the original backup, the incremental restore can delete those files from the base image. Incremental backups and restores can be performed only on mounted file systems, not on raw logical volumes.

Note: If for some reason a restored image is corrupted, you can use the **chkdsk** tool to attempt to repair the image.

Restoring Data from a Backup Set

Your Tivoli Storage Manager administrator can generate a backup set (a collection of your active files that reside on the server) onto portable media created on a device using a format that is compatible with the client device.

It is possible to generate a backup set as a number of special files if the device class the Tivoli Storage Manager administrator is *file*. These files can be stored locally (on client) to provide more restore flexibility for the client.

Portable media can be used on devices such as a tape, CD-ROM, DVD, and Iomega JAZ or ZIP drives. Current device support information is available at the following Web site:

`http://www.tivoli.com/support/storage_mgr/requirements.html`

You can restore backup sets from the following locations:

- From portable media on a device attached to your client workstation
- Directly from the server (You must be a root user to restore an entire backup set from the server, otherwise only files you own are restored.)

Backup sets can provide you with instant archive and rapid recovery capability as described below:

Instant Archive
This capability allows an administrator to create an archive collection from backup versions already stored on the server.

Rapid Recovery
When you are away from your office without a network connection and you lose data, you can restore the data from the backup set.

Notes:

1. If you cannot restore a backup set from portable media, check with your Tivoli Storage Manager administrator to ensure that the portable media was created on a device using a format that is compatible with your device.
2. There is no support in the Tivoli Storage Manager API for the backup set format.
3. To enable the GUI client to restore a backup set on an attached device on a UNIX standalone workstation, without requiring a server connection, use the ***localbackupset*** option. See "Localbackupset" on page 172 for more information.
4. Note that the **restore backupset** command supports restore of local backup sets from local media without using the ***localbackupset*** option.

Restoring an Entire or Partial Backup Set

Tivoli Storage Manager considers a backup set as one object containing the whole file structure. You can restore the entire backup set or just select portions. The backup set media is self-describing and contains all the information required to perform a successful restore.

Use the GUI to restore an entire backup set *only*. The command line can be used to restore an entire backup set or individual files within a backup set. See "Restore Backupset" on page 318 for information on how to use the **restore backupset** command.

Restoring Backup Sets Using the GUI

Attention: Before you begin a restore, be aware that backup sets can contain data for multiple file spaces. If you specify a destination other than the original location, data from *all* file spaces is restored to the location you specify.

To restore a backup set, perform the following steps:

- Click **Restore** from the main window. The Restore window appears.
- Locate the **Backup Sets** directory tree object and expand it.
  - To restore the backup set from a local device, expand the **Local** object and the Specify backup set location dialog is displayed. On the dialog, select **File name** or **Tape name** from the dropdown list and then enter the tape or file name location.
  - To restore an entire backup set from the server, expand the **Server** object and select the checkbox next to the desired backupset name.
- Click **Restore**. The Restore Destination window appears. Enter the appropriate information.

  Note: If the object you want to restore is part of a backup set generated on a node, and the node name is changed on the server, any backup set objects that were generated prior to the name change will not match the new node name. Ensure that the node name is the same as the node for which the backup set was generated.
- Click on **Restore**. The Task List window displays the restore processing status.

Note: To enable the GUI client to restore a backup set on an attached device on a UNIX standalone workstation, without requiring a server connection, use the ***localbackupset*** option. See "Localbackupset" on page 172 for more information. The **restore backupset** command supports restore of local backup sets from local media without using the ***localbackupset*** option. Also, certain local devices such as tape devices require device drivers to be setup prior to performing a restore. See

the device manual for assistance with this task. You will also need to know the device address in order to perform the restore.

Restore: Additional Considerations

This section discusses some advanced considerations for restoring data. You do not need to understand this information to use Tivoli Storage Manager for basic work.

Authorizing Another User to Restore/Retrieve Your Files

You can authorize another user on the same workstation or a different workstation to restore backup versions or retrieve archive copies of your files. This permits you to share files with other people or with other workstations that you use with a different node name. To authorize a user on another workstation to restore or retrieve your files, the other workstation must be running one of the UNIX clients. To authorize another user to restore or retrieve your files:

1. Click on **Utilities** from the main window. Click on **User Access List**. The User Access List window appears.
2. Enter the name of the node and user you want to authorize and the directory and file name for the file to which you want the user to have access. You can give the user access to backups or archives. You must add separate authorizations for backup and archive access, even if you want to give the same user access to the same files for both. You can authorize all users by using an asterisk (*) for the user name or authorize all nodes by using an asterisk (*) for the node name.
3. Click on **Add** to add the user. While you are in the User Access List window, you can add several users at once, delete users, or change your existing authorizations. All additions, deletions, and changes are processed when you click **OK**. Click **Cancel** to exit the user access list without making any changes.
4. Click **OK** to add the user to the user access list (the user is not added until you do this).

See “Set Access” on page 331, “Query Access” on page 301, and “Delete Access” on page 287 for information on using commands.

The Tivoli Storage Manager node you are authorizing must be registered with your Tivoli Storage Manager server.

Restoring or Retrieving Another User’s Files

After users grant you access to their files on the server, you can restore or retrieve those files to your local system. You can display another user’s file spaces on the server, restore the other user’s backup versions, or retrieve the other user’s archive copies to your local file system.

To display another user’s file spaces on the server, restore the other user’s backup versions, or retrieve the other user’s archive copies to your local drives:

1. Click **Utilities** from the main window.
2. Click **Access Another User**. The Access Another User window appears.
3. Type the node name of the user’s host machine in the Node name field. Type the user name in the User name field.
4. Click the **Set** button.

If you are using commands, use the ***fromnode*** and ***fromowner*** options to indicate the node name and the name of the user who owns the files.

For example, to restore files to one of your own file systems that were backed up from a workstation named Node1 and owned by a user named Ann, enter:

```
dsmc restore -fromn=node1 -fromo=ann "/home/proj/*" /home/gillis/
```

Use the **query filespace** command to get a list of file spaces (see "Query Filespace" on page 306). For example, to get a list of file spaces owned by Ann on Node1, enter:

```
dsmc query filespace -fromn=node1 -fromo=ann
```

See "Fromnode" on page 246 for more information about the ***fromnode*** option. See "Restore" on page 315 for more information about using the ***fromnode*** and ***fromowner*** options with the **restore** command. Also see"Retrieve" on page 325 for more information about the **retrieve** command.

Restore or Retrieve Files to Another Workstation

From a different workstation, you can restore or retrieve files you have already backed up from your own workstation. You must know the Tivoli Storage Manager password assigned to your node.

To restore or retrieve files to another workstation, use the ***virtualnodename*** option to specify the node name of the workstation from which you backed up the files. ***Virtualnodename*** cannot be set to the hostname of the machine. You can use the ***virtualnodename*** option when you start Tivoli Storage Manager or you can add the ***virtualnodename*** option to your client user options file dsm.opt. Use the ***virtualnodename*** option on the **dsm** command if you are borrowing another user's machine and you do not want to update their client user options file.

Tivoli Storage Manager prompts you for the password for your original node. After you enter the correct password, all file systems from your original workstation appear in the Restore or Retrieve window. You can restore or retrieve files as if you were working on your own workstation.

Attention: When you use this method to access files, you have access to all files backed up and archived from your workstation. You are considered a virtual root user.

You can use the ***virtualnodename*** option in a command. For example, to restore your ***projx*** files, enter:

```
dsmc restore -virtualnodename=nodeone "/home/monnett/projx/*"
```

If you do not want to restore or retrieve the files to the same directory name on the alternate workstation, enter a different destination.

The considerations for retrieving files are the same as restoring files.

Restoring a Disk In Case of Disk Loss

Tivoli Storage Manager can recover your files only if you can run the client. If the file system that contains the client is lost, you must reinstall the client before you can recover your files. If you also lose the file system that contains the operating system and communication software, you must recover them before you can connect to the server.

To protect yourself against these kinds of losses, you need to put together a set of installation media that you can use to restore your system to a state that lets you contact the server and begin recovering data. The installation media should contain:

1. A bootable operating system that lets you perform basic functions.
2. A correctly configured communication program that lets you establish communications with the server.
3. A client with appropriate customized options files. You can use the command-line client to complete this task.

The communication package you use determines what files you need. Consult your operating system and communication software manuals to set up your installation media.

If you also have the Tivoli Space Manager installed on your workstation, your installation media should include the space manager command line client. For information about restoring migrated files, see *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794.

Note: Your administrator can schedule restore operations which can be very useful when you need to restore a large number of files.

Deleting File Spaces

Authorized User

If your Tivoli Storage Manager administrator gives you authority, you can delete entire file spaces from the server. You cannot delete individual backup versions that are kept on the server. When you delete a file space, you delete all the files and images, both backup versions and archive copies, that are contained within the file space. For example, if you delete the file space for your **/home/monnet** file system, you are deleting every backup for every file in that file system and every file you archived from that file system. Carefully consider whether you want to delete a file space.

You can delete file spaces using the Tivoli Storage Manager GUI or command line clients. To delete NAS file spaces, use the Web client or command line client.

To delete a file space using the GUI, perform the following steps:

1. Select **Utilities→ Delete Filespaces** from the main window.
2. Click the selection boxes next to the file spaces you want to delete.
3. Click the **Delete** button. Tivoli Storage Manager prompts you for confirmation before deleting the file space.

You can also delete a file space using the **delete filespace** command. See "Delete Filespace" on page 289 for more information. Use the ***class*** option with the **delete filespace** command to delete NAS file spaces. See "Class" on page 237 for more information.

Chapter 6. Archiving and Retrieving Files

Archiving and retrieving files is similar to backing up and restoring files. Many of the windows and concepts are similar. In this chapter, we cover the main archive and retrieve tasks, but where windows and concepts are the same, as for backup and restore, see Chapter 4, "Backing Up Files and Directories" on page 53.

All client archive and retrieve procedures in this chapter also apply to the Web client, except the following:

- Estimate
- View Policy Information
- Access Another User
- Searching and Filtering
- User Access List
- Preferences Editor

See "Starting a Web Client Session" on page 44 for information on starting the Web client.

Task	Page
Performing a GUI Archive	85
Performing a Command Line Archive	86
Deleting Archived Files	86
Performing a GUI Retrieve	88
Performing a Command Line Retrieve	89

Archiving Files

To archive files, you need to specifically select the files to archive. You can select the files by using a file specification or by selecting them from a directory tree.

Your administrator might have set up schedules to archive certain files on your workstation automatically. See Chapter 7, "Automating Tasks" on page 91 for information on checking and running the schedules available to you. The following sections cover how to archive files without using a schedule.

Estimating Backup Processing Time

You can use the estimate function to estimate the amount of time it takes to process your files and directories. The estimated time is a rough calculation of the time it takes Tivoli Storage Manager to transfer your data and is based on previous transfers of data between your workstation and the current server. The actual transfer time could be longer or shorter than the estimate due to factors like network traffic, system load on your workstation, or system load on the server.

Performing a GUI Archive

You can archive a file or a group of files using file names, or you can select files that match your search criteria using a directory tree. Perform archives using the following procedure:

1. Click **Archive files and directories into long term storage** from the main window. The Archive window appears.

© Copyright IBM Corp. 1993, 2002

2. Expand the directory tree by clicking the plus sign **(+)** or the folder icon next to an object in the tree. To search or filter files, click the **Search** icon from the tool bar.
   To search:
   a. Enter your search criteria in the Find Files (Archive) window.
   b. Click the **Search** button. The Matching Files (Archive) window appears.
   c. Click the selection boxes next to the files you want to archive and close the Matching Files (Archive) window.
   To filter:
   1) Enter your filter criteria in the Find Files (Archive) window.
   2) Click the **Filter** button. The Archive window displays the filtered files.
   3) Click the selection boxes next to the filtered files or directories you want to archive.
3. Enter the description, accept the default description, or select an existing description for your archive package in the Description box. When an existing archive description is used, the files or directories selected are added to the archive package. All archived packages with the same description are grouped for retrieves, queries, and deletions.
4. To modify specific archive options, click the **Options** button located to the right of the **Estimate** button. Any options you change are effective during the current session *only*. To estimate the transfer time for your archive selections click the **Estimate** button.
5. Click on **Archive**. The Archive **Task List** window displays the archive processing status.

Performing a Command Line Archive

You can use wildcards to archive more than one file at a time. You can archive all the files in a directory, and you can use the ***subdir=yes*** option to include files in all subdirectories under that directory. Use the ***deletefiles*** option if you want to delete the files from your local workstation after they are archived and committed to storage.

For example, to archive the files in the /home/jones/proj directory and the files in its subdirectories, enter:

```
dsmc archive /home/jones/proj/ -subdir=yes -deletefiles
```

You can use more than one file specification on the **archive** command. For example, to archive the /home/jones/h1.doc and /home/jones/test.doc files, use:

```
dsmc archive /home/jones/h1.doc /home/jones/test.doc
```

Use the ***description*** option to assign a description to the archive:

```
dsmc archive /home/jones/h1.doc -description="Chapter 1,
first version"
```

When the **archive** command completes, Tivoli Storage Manager displays archive processing statistics These statistics are also recorded in the schedule log for scheduled commands. See "Archive" on page 279 for more information.

Deleting Archived Files

You can delete archive copies if you decide you no longer need them. Unlike backup versions, you can delete individual archive copies without deleting the entire file space. To delete an archive copy:

1. Click on **Utilities** from the client GUI main window.

2. Click on **Delete Archive Data**. The Archive Delete window displays.
3. Expand the directory tree. The directory tree contains groups of files identified by a description and archived to the server.
4. Click the selection boxes to select the objects you want to delete.
5. Click on **Delete**. The Archive Delete Status window displays the archive deletion processing status.

If you are using commands, you can delete archive copies with the **delete archive** command.

For example, to delete the file `/home/jones/t.exe`, enter:

```
dsmc delete archive /home/jones/t.exe
```

Archive: Advanced Considerations

This section covers some advanced considerations in archiving files. You do not need to understand this information in order to use Tivoli Storage Manager for basic work.

Saving Access Permissions

When you archive a file, Tivoli Storage Manager saves standard UNIX access permissions assigned to the file. Depending on your operating system, it also saves extended permissions. For example, for files on an AIX workstation, Tivoli Storage Manager saves access control lists.

If you are a user, and you archive a file to which you have read access, you own the archived copy of the file. You are the only user who can retrieve the archived file unless you grant access to another user.

Understanding How Symbolic Links are Handled

When you archive a symbolic link, Tivoli Storage Manager archives the file to which the symbolic link points. It does not archive path information for the directory.

If you archive a symbolic link that points to a directory, Tivoli Storage Manager archives the files contained in the directory (and its subdirectories if the ***subdir*** option is set to yes) under the name of the symbolic link.

Use the ***archsymlinkasfile*** option to specify whether Tivoli Storage Manager archives the symbolic link and the file or directory it points to, or the symbolic link only. See "Archsymlinkasfile" on page 123 for more information.

The following table shows symbolic link archive and retrieve functions and the action taken:

Table 15. Symbolic Link Management Table for Archive and Retrieve

Function	Action Taken
Archive of a file link.	Archives the file to which the symbolic link points.
Archive of a directory link.	Archives the directory and its contents.
Archive of a file with subdir=yes.	Archives the directory, its contents, and contents of subdirectories.
Archive of a directory with subdir=yes.	Archives the directory, its contents, and contents of subdirectories.

Table 15. Symbolic Link Management Table for Archive and Retrieve (continued)

Function	Action Taken
Archive of a symbolic link that points to a file or directory that does not exist.	Archives the symbolic link.
Retrieve a symbolic link that points to file; the file and link exist.	Replaces the file if replace=y is set.
Retrieve a symbolic link that points to file; the symbolic link no longer exists.	Retrieves the file replacing the file name with the symbolic link name and places it in the directory where the symbolic link resided.
Retrieve a symbolic link that points to a directory; the symbolic link and directory no longer exist.	A directory is created in the directory where the symbolic link resides, and all files and subdirectories are restored to that directory. The symbolic link name is used as the new directory name.
Retrieve a symbolic link that points to a directory; the symbolic link and directory still exist.	Tivoli Storage Manager will not retrieve as long as the symbolic link exists.

Understanding How Hardlinks are Handled

When you archive a file that is hard linked to another file, Tivoli Storage Manager stores both the link information and the data file on the server.

When you retrieve a hard linked file, Tivoli Storage Manager attempts to re-establish its links. For example, if you had a hard linked pair of files, and only one of the hard-linked files was on your workstation, when you retrieve both files, they will be hard-linked together.

The one exception to this procedure occurs if you archive two files that are hard-linked together and then break the connection between them on your workstation. The two files then contain separate data files. If you retrieve the two files from the server, Tivoli Storage Manager respects the current file system and does not restore the hard link.

Problems can occur if you back up only one file of a set of hard-linked files. For example, files `texta` and `textb` are hard linked to each other. You archive `texta`, then edit `textb` and make some changes. If you retrieve `texta`, the changes you made to `textb` will be lost.

To ensure that hard-linked files remain synchronized, always archive all hard links at the same time and restore those same files together.

Retrieving Archives

Retrieve a file when you want to return an archive copy from the server to your workstation.

Many of the advanced considerations for retrieving files are the same as for restoring files. See "Authorizing Another User to Restore/Retrieve Your Files" on page 81, "Restoring or Retrieving Another User's Files" on page 81, and "Restore or Retrieve Files to Another Workstation" on page 82.

Performing a GUI Retrieve

To retrieve an archived file:

1. Click **Retrieve files and directories from long term storage** from the client GUI main window. The Retrieve window appears.
2. Expand the directory tree by clicking the plus sign **(+)** or the folder icon next to an object you want to expand. To search or filter files, click the **Search** icon from the tool bar.
   To search:
   a. Enter your search criteria in the Find Files (Retrieve) window.
   b. Click the **Search** button. The Matching Files (Retrieve) window appears.
   c. Click the selection boxes next to the files you want to retrieve and close the Matching Files (Retrieve) window.

   To filter:
   1) Enter your filter criteria in the Find Files (Retrieve) window.
   2) Click the **Filter** button. The Retrieve window displays the filtered files.
   3) Click the selection boxes next to the filtered files or directories you want to retrieve.
3. To modify specific retrieve options, click the **Options** button. Any options you change are effective during the current session *only*. To estimate the transfer time for your archived selections, click the **Estimate** button.
4. Click **Retrieve**. The Retrieve Destination window appears. Enter the appropriate information in the Retrieve Destination window.
5. Click **Retrieve**. The Retrieve **Task List** window displays the retrieve processing status.

Performing a Command Line Retrieve

Use the **retrieve** command to retrieve files. Indicate the file you want to retrieve and the destination. If you do not indicate a destination, the files are retrieved to their original location. For example, to retrieve the `/home/jones/h1.doc` file to its original directory, enter:

```
dsmc retrieve /home/jones/h1.doc
```

To retrieve the `/home/jones/h1.doc` file under a new name, enter:

```
dsmc retrieve /home/jones/h1.doc /home/jones/h2.doc
```

Use the ***pick*** option to get a list of archives from which you can select. Also see "Retrieve" on page 325 for more information.

Understanding How Your Archives are Managed

As with backing up files, Tivoli Storage Manager checks the ***include*** options in your include-exclude options list to determine which management class to assign to your archived files. If you do not specifically assign a management class to a file with an ***include*** option, Tivoli Storage Manager assigns the file the default management class. Tivoli Storage Manager can only archive a file if the selected management class contains an archive copy group.

You can override the default management class by using the ***archmc*** option, or by selecting the management class from the **Options** menu in the GUI.

For information on the various management class attributes used to manage your archives, see "Displaying Information about Management Classes and Copy Groups" on page 99. See "Assigning a Management Class to Files" on page 102 for information about using the include-exclude options list.

Chapter 7. Automating Tasks

This chapter applies to the **Authorized User** only. Root authorization is only required when updating the `/etc/inittab` and `/etc/rc` files.

Your administrator can schedule Tivoli Storage Manager to perform tasks automatically on a regular basis. For example, you can automatically back up files at the end of each day or archive some of your files every Friday. This procedure, known as *central scheduling*, is a cooperative effort between the server and your client node. Your administrator associates clients with one or more schedules that are part of the policy domain maintained in the server database. The administrator defines central scheduling on the server and you start the client scheduler on your workstation. Once you start the client scheduler, further intervention is not necessary.

With client scheduling, you can also:
- Display information about available schedules.
- Display information about work that the schedule has completed.
- Modify scheduling options in the client options file.

Notes:

1. The schedule start time is based on the server's local time, not the workstation's.
2. Install the command line client and ensure the communication software is running before you start the client scheduler.

Specifying Scheduling Options

You can modify scheduling options in the client system options file `dsm.sys` or in the graphical user interface. However, if your administrator specifies a value for these options, that value overrides the value in your client.

For more information about scheduling options, changing the scheduling mode, specifying the TCP/IP address or port number, or running commands before or after a schedule, see "Scheduling Options" on page 115.

Return Codes from the Command Line Interface

Earlier versions of the backup-archive client did not exit with consistent, documented return codes. This made automation with scripts, batch files, or other scheduling facilities difficult, since there was no easy means of accurately determining the success or failure of the client operation.

The backup-archive command line interface now exits with a return code that accurately reflects the success or failure of the client operation. Users who already have scripts, batch files, or other scheduling or automation facilities that interpret the return code from the command line interface may need to make changes in order to accommodate these new return codes.

In general, the return code is related to the highest severity message during the client operation.

© Copyright IBM Corp. 1993, 2002

- If the highest severity message is informational (ANSnnnnI), then the return code will be 0.
- If the highest severity message is a warning (ANSnnnnW), then the return code will be 8.
- If the highest severity message is an error (ANSnnnnE), then the return code will be 12.

The exception to the above rules are warning or error messages that individual files could not be processed. For such a skipped file, the return code will be 4. For cases where the return code is not 0, you can examine the dsmerror.log file (and, for scheduled events, the dsmsched.log file).

For a description of the return codes and their meanings, see Table 16

Table 16. Return Codes and Meanings

Code	Explanation
0	All operations completed successfully.
4	The operation completed successfully, but some files were not processed. There were no other errors or warnings. This return code is very common. Files are not processed for various reasons. The most common reasons are: • The file is in an exclude list.. • The file was in use by another application and could not be accessed by the client • The file changed during the operation to an extent prohibited by the copy serialization attribute. See "Copy Serialization" on page 100.
8	The operation completed with at least one warning message. For scheduled events, the status will be "Completed". Review dsmerror.log (and dsmsched.log for scheduled events) to determine what warning messages were issued and to assess their impact on the operation.
12	The operation completed with at least one error message (except for error messages for skipped files). For scheduled events, the status will be "Failed". Review dsmerror.log (and dsmsched.log for scheduled events) to determine what error messages were issued and to assess their impact on the operation. As a general rule, this return code means that the error was severe enough to prevent the successful completion of the operation. For example, an error that prevents an entire file system from being processed yields return code 12. When a file is not found the operation yields return code 12.

The return code for a client macro will be the highest return code issued among the individual commands that comprise the macro. For example, suppose a macro consists of these commands:

```
SELECTIVE  C:\MyTools\* -SUBDIR=YES
INCREMENTAL  C:\MyPrograms\TestODBCDriver\* -SUBDIR=YES
ARCHIVE  E:\TSM510C\* -SUBDIR=YES
```

If the first command completes with return code 0; the second command completes with return code 8; and the third command completes with return code 4, the return code for the macro will be 8.

Managing the Client Scheduler Using the Client Acceptor Daemon

The Tivoli Storage Manager Client Acceptor daemon can manage the scheduler, reducing the number of background processes on your workstation. This also resolves memory retention problems that may occur when using manual methods of running the scheduler.

Use the ***managedservices*** option in your client system options file to specify whether the Client Acceptor daemon manages the scheduler. See "Managedservices" on page 174 for more information.

Configuring the CAD to Manage the Scheduler

Perform the following steps to configure the CAD to manage the client scheduler:

1. Install the Web client. See "Installing and Using the Web Client" on page 46 for more information.
2. Install the Scheduler. See "Starting the Client Scheduler" for more information.
3. From the Tivoli Storage Manager GUI open the **Edit** menu and select **Preferences** . Then select the **Web Client** tab. Check the **Schedule** option in the **Managed Services** options section. If you wish to run the Web client also, check the **Web Client** option. Otherwise, uncheck the **Web Client** option so the Web client cannot be used.
4. Start the Client Acceptor. See "Installing and Using the Web Client" on page 46 for more information.

Starting the Client Scheduler

To start the client scheduler on your client node and connect to the server schedule, change to the Tivoli Storage Manager installation directory and enter the following command:

```
dsmc schedule
```

When you start the client scheduler, it runs continuously until you close the window, end the process, or log off your system.

To run the **schedule** command in the background and to keep the client scheduler running, even if you log off your system, enter the following:

```
nohup dsmc schedule 2> /dev/null &
```

If a Tivoli Storage Manager password is required for your workstation and you want to run the **schedule** command in the background, enter the password with the command.

Root User: To start the client scheduler automatically, ensure that the ***passwordaccess*** option is set to `generate` in your client system options file (dsm.sys), then follow the procedure below for your operating system:

- **For non-OS/390 UNIX**, add the following entry to the **/etc/inittab** file:

  ```
  tsm::once:/usr/bin/dsmc sched > /dev/null 2>&1 # TSM scheduler
  ```

  Note: You must include the redirection to `/dev/null` in the command.

For OS/390 UNIX:

1. Create a shell script called `/tivoli/tsm/client/ba/bin/rundsmc` which contains the following entries:

```
cd /usr/lpp/Tivoli/tsm/client/ba/bin
sleep 60
./dsmc schedule
```

This prevents the creation of two jobs with the same name and enables automatic shutdown. You may need to customize the time for your system. Refer to the user's manual for complete client scheduler instructions.

2. Add the following entries in the `/etc/rc` file to set environment variables to retrieve the ***servername*** and ***nodename*** options from `dsm.sys` and to start the client scheduler, as follows:

```
# Set environment variables to retrieve the servername and
# nodename options from dsm.sys.
export DSM_DIR=/tivoli/tsm/client/ba/bin
export DSM_CONFIG=/tivoli/tsm/client/ba/bin/dsm.opt
# Start the TSM Client scheduler and redirect outputs to
# schedule.out instead of the /etc/log file.
_BPX_JOBNAME='ADSMCLNT' /tivoli/tsm/client/ba/bin/rundsmc
1>/tivoli/tsm/client/ba/bin/schedule.out 2>&1 &
```

Note: Enter the _BPX_JOBNAME entry on a single line in the `/etc/rc` file.

The client scheduler may fail to initialize properly at IPL because TCP/IP is not fully initialized. You may need to customize the time for your system to compensate for this.

Tivoli Storage Manager does not recognize changes made to the dsm.opt or the dsm.sys file while the client scheduler is running. If you make changes to these files while the client scheduler is running, and you want to use the new values immediately, stop the client scheduler and restart it. For example, if you change the ***inclexcl*** option in your dsm.sys file to point to a different include-exclude options file, you must stop the client scheduler and restart it before Tivoli Storage Manager uses the new file.

To manually stop the client scheduler, enter the **kill** command if it is running in the background, or press **q** or **Ctrl+C** if it is running in the foreground. To restart the client scheduler, enter the **schedule** command again.

Tape prompting does not occur during a scheduled event regardless of the ***tapeprompt*** option setting in your options file.

Use the Client Acceptor daemon to manage the Client Scheduler. See "Managing the Client Scheduler Using the Client Acceptor Daemon" on page 93 for more information.

Displaying Information about Scheduled Work

To view schedules that are defined for your client node, enter:

```
dsmc query schedule
```

Tivoli Storage Manager displays detailed information about all scheduled work for your client node. The figure below displays sample **query schedule** output.

```
 Schedule Name: DAILY_INC
   Description: Daily System-wide backup
        Action: Incremental
       Options: QUIET
       Objects:
      Priority: 1
Next Execution: 30 minutes
      Duration: 4 Hours
        Period: 1 Day
   Day of Week: Any
        Expire: Never

 Schedule Name: WEEKLY_INC
   Description: Weekly backup for project files
        Action: Incremental
       Options: QUIET
       Objects: /proj
      Priority: 1
Next Execution: 60 minutes
      Duration: 8 Hours
        Period: 7 Days
   Day of Week: Friday
        Expire: Never
```

Figure 2. Sample Query Schedule Output

The schedule name, **DAILY_INC**, starts a daily incremental backup. The next incremental backup will start in 30 minutes. Because no objects are listed, Tivoli Storage Manager runs the incremental backup on your default domain. The schedule has no expiration date.

The schedule name, **WEEKLY_INC**, starts a weekly incremental backup in the `/proj` file system.

Displaying Information about Completed Work

When you run the **schedule** command in the foreground, your screen displays output from the scheduled commands. Output is also directed to the dsmsched.log file in the current directory unless you change the path and file name using the ***schedlogname*** option.

When you run the **schedule** command in the background, output from scheduled commands is directed to the `dsmsched.log` file in the current directory, or to the path and file name that you specified. Please note that the `dsmsched.log` cannot be a symbolic link.

After scheduled work is performed, check the schedule log to verify that all work completed successfully.

When a scheduled command is processed the schedule log may contain the following entry:

```
Scheduled event eventname completed successfully
```

The client indicates whether Tivoli Storage Manager successfully issued the scheduled command associated with the *eventname*. No attempt is made to determine the success or failure of the command. You can assess the status of the command by evaluating the return code from the scheduled command in the schedule log. The schedule log entry for the command's return code is prefaced with the following text:

```
Finished command. Return code is:
```

The schedule log continues to grow unless you prune it using the ***schedlogretention*** option. See "Specifying Scheduling Options" on page 91 for more information.

Scheduling Options for Commands

The scheduler executes commands under a user ID of `0`; however, some commands may need to be executed under a user ID different than `0`. In this case, your Tivoli Storage Manager administrator can define schedules for commands that will be executed under a user ID different from the scheduler user ID using the ***schedcmduser*** server option.

The ***schedcmduser*** option specifies the name of a valid user on the system where a scheduled command is executed. If this option is specified, the command is executed with the authorization of the specified user. Otherwise, it is executed with the scheduler authorization. This option is valid for UNIX clients *only*.

user_name
Specifies the name of a valid user on the system where a scheduled command is executed.

Enabling-Disabling Scheduled Commands

You can query the schedules defined by your Tivoli Storage Manager administrator by entering the following command:

```
query schedule
```

You can use the ***schedcmddisabled*** option to disable the scheduling of commands by the server. Commands are scheduled by using the ***action***=**command** option on the **define schedule** server command.

The ***schedcmddisabled*** option does not disable the ***preschedulecmd*** and ***postschedulecmd*** commands. However, you can specify ***preschedulecmd*** or ***postschedulecmd*** with a blank or a null string to disable the scheduling of these commands. See "Schedcmddisabled" on page 199 for more information.

Chapter 8. Understanding Storage Management Policies

Storage management policies are rules your administrator defines in order to manage your backups and archives on the server. You can associate (or *bind*) your data to these policies; then when the data is backed up or archived, it is managed according to policy criteria. Policy criteria include a policy domain, a policy set, a copy group, and a management class.

Policies determine:
- Whether a file is eligible for backup or archive services.
- How many backup versions to keep.
- How long to keep inactive backup versions and archive copies.
- Where to place the copies in storage.

If you have the Tivoli Space Manager client installed, your administrator also defines rules that determine whether files are eligible for migration from your local file systems to storage.

This chapter explains:
- Policy criteria (policy domains, policy sets, copy groups, and management classes).
- How to display policies.
- How Tivoli Storage Manager associates your data with policies.

Using Policy Domains and Policy Sets

A *policy domain* is a group of clients with similar requirements for backing up and archiving data. Policy domains contain one or more policy sets. An administrator uses policy domains to manage a group of client nodes in a logical way. For example, a policy domain might include:
- A department, such as Accounting.
- A physical location, such as a particular building or floor.
- A local area network, such as all clients associated with a particular file server.

Tivoli Storage Manager includes a default policy domain named *Standard*. At first, your client node might be associated with the default policy domain. However, your administrator can define additional policy domains if there are groups of users with unique backup and archive requirements.

A *policy set* is a group of one or more management classes. Each policy domain can hold many policy sets. The administrator uses a policy set to implement different management classes based on business and user needs. Only one of these policy sets can be active at a time. This is called the *active policy set*. Each policy set contains a *default management class* and any number of additional management classes.

Using Management Classes and Copy Groups

A *management class* is a collection of backup and archive copy groups that establishes and contains specific storage management requirements for backing up and archiving data. An administrator can establish separate management classes to meet the backup and archive requirements for different kinds of data, such as:

© Copyright IBM Corp. 1993, 2002

- System data that is critical for the business.
- Application data that changes frequently.
- Report data that Management reviews monthly.
- Legal information that must be retained indefinitely, requiring a large amount of disk space.

Note: If you have the Tivoli Space Manager client installed, it can also contain specific requirements for migrating files to storage.

Most of the work you do with storage management policies is with management classes. You must associate (or *bind*) each file and directory that you back up and each file that you archive with a management class. If you do not associate a file with a management class, Tivoli Storage Manager uses the default management class in the active policy set. If you do not specify a management class for directories, Tivoli Storage Manager uses the management class in the active policy set specifying the longest retention period.

You can use ***include*** statements in your include-exclude list to associate files with management classes. See "Selecting a Management Class for Files" on page 102 for more information. In your client system options file `dsm.sys` file, you can associate directories with a management class, using the ***dirmc*** option. See "Selecting a Management Class for Directories" on page 103 for more information.

Within a management class, the specific backup and archive requirements are in *copy groups*. Copy groups define the specific storage management attributes that describe how the server manages backed up or archived data. Copy groups include both *backup copy groups* and *archive copy groups*. A management class can have one backup copy group, one archive copy group, both, or neither.

A *backup copy group* contains attributes that are used during the backup process to determine:
- Whether a file that has changed since the last backup is backed up again.
- How many days must elapse before a file is backed up again.
- How a file is processed during a backup if it is in use.

It also contains attributes to manage the backup versions of your files on the server. These attributes control:
- Where the server stores backup versions of your files and directories.
- How many backup versions the server keeps of your files and directories.
- How long the server keeps backup versions of your files and directories.

An *archive copy group* contains attributes that control:
- Whether a file is archived if it is in use
- Where the server stores archived copies of your files
- How long the server keeps archived copies of your files

When the server is unable to rebind a file to an appropriate management class, the server uses one of two values to determine the number of days to retain the file. If it is a backup version, the server uses ***backup grace period retention***. If it is an archive copy, the server uses ***archive grace period retention***. For more information about grace periods, see "Using a Retention Grace Period" on page 105.

Displaying Information about Management Classes and Copy Groups

Before you select the management classes you want to use, click **View policy information** from the Utilities menu. The **Policy Information** window is displayed. You can then determine which management classes are available. You can also use the ***detail*** option on the **query mgmtclass** command to view the available management classes.

The **Display policy information** window provides the following information:
- The name of the default management class.
- The name of the policy domain to which the management class belongs.
- The policy set that is currently active.
- The date and time that this policy set became active.
- The number of days to retain an backed up version or archived copy.
- The management class name and a description.

Table 17 shows the default values for the backup and archive copy groups in the standard management class. Each attribute is discussed in more detail immediately following the table.

Table 17. Default Values in the Standard Management Class

Attribute	Backup Default	Archive Default
Copy group name	Standard	Standard
Copy type	Backup	Archive
Copy frequency	0 days	CMD (Command)
Versions data exists	Two versions	Does not apply
Versions data deleted	One version	Does not apply
Retain extra versions	30 days	Does not apply
Retain only version	60 days	Does not apply
Copy serialization	Shared static	Shared static
Copy mode	Modified	Absolute
Copy destination	Backuppool	Archivepool
Retain versions	Does not apply	365 days

Copy Group Name

The name of the copy group. The default value for both backup and archive is *Standard*.

Copy Type

The type of copy group. The value for backup is always *Backup*, and the value for archive is always *Archive*.

Copy Frequency

Copy frequency is the minimum number of days that must elapse between successive incremental backups. Use this attribute during a full incremental backup.

Copy frequency works with the *mode* parameter. For example, if frequency is *zero (0)* and mode is *modified*, a file or directory is backed up *only if* it changed since the

last incremental backup. If frequency is *zero (0)* and mode is *absolute*, a file is backed up every time you run an incremental backup against it. This attribute is not checked for selective backups.

For archive copy groups, copy frequency is always CMD (command). There is no restriction on how often you archive a file.

Versions Data Exists

The *Versions Data Exists* attribute specifies the maximum number of different backup versions retained for files and directories currently on your drive. If you select a management class that permits more than one backup version, the most recent version is called the *active* version. All other versions are called *inactive* versions. If the maximum number of versions permitted is five, and you run a backup that creates a sixth version, the oldest version is deleted from server storage.

Versions Data Deleted

The *Versions Data Deleted* attribute specifies the maximum number of different backup versions retained for files and directories that you erased from your drive. This parameter is ignored as long as the file or directory remains on your drive.

If you erase the file or directory, the next time you run an incremental backup, the active backup version is changed to inactive and the oldest versions are erased that exceed the number specified by this parameter.

The expiration date for the remaining versions is based on the *retain extra versions* and *retain only version* parameters.

Retain Extra Versions

The *Retain Extra Versions* attribute specifies how many days all but the most recent backup version is retained. The most recent version is the active version, and active versions are never erased. If *Nolimit* is specified, extra backup versions are deleted based on the *versions data exists* or the *versions data deleted* parameter settings.

Retain Only Version

The *Retain Only Version* attribute specifies the number of days the last remaining inactive version of a file or directory is retained. If *Nolimit* is specified, the last version is retained indefinitely.

This parameter goes into effect during the next incremental backup after a file is deleted from the client machine. Any subsequent updates to this parameter will not affect files that are already inactive. For example: If this parameter is set to 10 days when a file is inactivated during an incremental backup, the file will be expired in 10 days.

Copy Serialization

The *Copy Serialization* attribute determines whether a file can be in use during a backup or archive, and what to do if it is. The value for this attribute can be one of the following:

- **Static**. A file or directory must not be modified during a backup or archive. If the object is changed during a backup or archive attempt, it is not backed up or archived.

- **Shared static**. A file or directory must not be modified during backup or archive. Tivoli Storage Manager attempts to perform a backup or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your client system options (dsm.sys) file. If the object is changed during every backup or archive attempt, it is not backed up or archived.
- **Dynamic**. A file or directory is backed up or archived on the first attempt regardless of whether it changes during a backup or archive.
- **Shared dynamic**. A file or directory is backed up or archived regardless of whether it changes during a backup or archive. Tivoli Storage Manager attempts to perform a back up or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your client system options file without the file changing during the attempt. The file is backed up or archived on the last try even if it has changed.

  Note: Be careful when you select a management class containing a copy group that specifies shared dynamic or dynamic for serialization backup. If you select a management class that permits a file to be backed up or archived while it is in use, the backup version or archived copy stored on the server might be a fuzzy copy. A *fuzzy copy* is a backup version or archived copy that does not accurately reflect what is currently in the file. It might contain some, but not all, of the changes. If that is not acceptable, select a management class that creates a backup version or archive copy only if the file does not change during a backup or archive.

  If you restore or retrieve a file that contains a fuzzy copy, the file might not be usable.

Copy Mode

The *Copy Mode* attribute determines whether a file or directory is considered for incremental backup regardless of whether it changed or not since the last backup. Tivoli Storage Manager does not check the mode for selective backups. The value for this parameter can be one of the following:

- **Modified.**The file is considered for incremental backup *only if* it has changed since the last backup. A file is considered changed if any of the following are true:
  The date or time of the last modification is different.
  The file size is different.
  The file attributes, with the exception of archive, are different. However, if only the file meta-data changes (such as access permissions), but the file data does not change, Tivoli Storage Manager may back up only the meta-data.
  The file owner is different.
  The file permissions are different.
- **Absolute.** The file is considered for incremental backup regardless of whether it changed since the last backup. For archive copy groups, the mode is always *absolute*, indicating that a file is archived regardless of whether it changed since the last archive request.

Copy Destination

Names the destination where backups or archives are stored. The destination can be either a storage pool of disk devices or a storage pool of devices that support removable media, such as tape.

Retain Versions

Specifies the number of days an archived file remains in storage. When the specified number of days elapse for an archived copy of a file, it is deleted from server storage.

Selecting a Management Class for Files

If the default management class meets the backup and archive requirements for all the files on your workstation, it is not necessary to take any action to associate your files with that management class. This is done automatically when you back up or archive your files.

When selecting a different management class for your files, consider these questions:

- Does the management class contain a backup copy group?

  If you attempt to back up a file associated with a management class that does not contain a backup copy group, the file is not backed up.
- Does the management class contain an archive copy group?

  If you attempt to archive a file associated with a management class that does not contain an archive copy group, the file is not archived.
- Does the backup copy group contain attributes that back up your files often enough?

  Mode and frequency work together to control how often a file is backed up when you use incremental backup. Tivoli Storage Manager does not check those attributes for selective backup.
- Do the copy groups specify either static or shared static for serialization?

  If serialization is shared dynamic or dynamic, you might get fuzzy backups or archive copies. Verify that this is acceptable. For example, you might want to use shared dynamic or dynamic serialization for a file to which log records are continuously added. If you used static or shared static serialization, the file might never back up because it is constantly in use. With shared dynamic or dynamic serialization, the file is backed up, but the backup version of the file might contain a truncated message. Do not use shared dynamic or dynamic serialization for a file if it is very important that the backup version or archive copy contain all changes.
- Does the backup copy group specify an adequate number of backup versions to keep, along with an adequate length of time to keep them?
- Does the archive copy group specify an adequate length of time to keep archived copies of files?

Assigning a Management Class to Files

A management class defines when your files are included in a backup, how long they are kept on the server, and how many versions of the file the server should keep. The server administrator selects a default management class. You can specify your own management class to override the default management class.

You can assign a management class for a file or file group by using an **include** statement in your client systems options (dsm.sys) file or the include-exclude file specified by the ***inclexcl*** option. Management class names are not case-sensitive. For example, to associate all the files in the `costs` directory with a management class named **budget**, you would enter:

```
include /home/jones/costs/* budget
```

To specify a management class named **managall** to use for all files to which you do not explicitly assign a management class, you would enter:

```
include * managall
```

The example below demonstrates how to use a management class:

```
exclude /.../*.sno
include /home/winter/.../*.ice      mcweekly
include /home/winter/december/*.ice mcdaily
include /home/winter/january/*.ice  mcmonthly
include /home/winter/winter/white.sno
```

Processing follows these steps:

1. The file named `white.sno` is backed up following bottom-up processing rules. Because you did not specify a management class, the file is assigned to the default management class.
2. Any file with an extension of `ice` in the `/home/winter/january` directory is assigned to the management class, ***mcmonthly***.
3. Any file with an extension of `ice` in the `/home/winter/december` directory is assigned to the management class, ***mcdaily***.
4. Any other files with an extension of `ice` in any directory under `/home/winter` are assigned to the management class, ***mcweekly***.
5. Any file with an extension of `sno` (except `/home/winter/winter/white.sno`) in any directory is excluded from backup.

To specify your own default management class for files that are not explicitly included, specify:

```
include * mgmt_class_name
```

as the first include or exclude option defined.

When you archive a file using the graphical user interface, you can select a different management class to override the management class assigned to the file.

Overriding the Management Class for Archived Files

When you archive a file, you can override the assigned management class using the graphical user interface (GUI), or by using the ***archmc*** option on the **archive** command. To use the GUI, press the Archive Options button on the archive tree to override the management class and select a different management class. For example, to associate the file, `/home/jones/budget.jan`, with the management class **ret2yrs**, you would enter:

```
dsmc archive –archmc=ret2yrs /home/jones/budget.jan
```

Selecting a Management Class for Directories

If the management class in your active policy set containing the longest retention period meets your backup requirements for directories, it is not necessary to take any action to associate directories with that management class. Tivoli Storage Manager does it automatically when it backs up your directories.

If the default management class does not meet your requirements, select a management class with an adequate retention period specified on the *retain only version* parameter. You should keep directories at least as long as you keep the files associated with those directories.

To assign a management class other than the default to directories, use the ***dirmc*** option in your client system options file (dsm.sys). For example, to assign a management class named **direct1** to your directories, you would enter:

```
dirmc direct1
```

Note: For archive operations, directories are assigned to a management class whose retention period meets or exceeds that of the files contained in those directories. The management class is rebound as needed to ensure that directories with files do not expire.

Binding and Rebinding Management Classes to Files

Binding associates a file with a management class. When you back up a file for the first time, Tivoli Storage Manager binds it to either the default management class or the management class specified in your include-exclude list. In later backups of the same file, if you change the management class, both active and inactive versions are bound again to the new management class.

If the backup copy group for the management class specifies keeping multiple backup versions of the file, and you request multiple backups, the server always has one active backup version (the current version) and one or more inactive backup versions of the file. All backup versions of a file are bound to the same management class and are managed based on the attributes in the backup copy group.

When you archive a file for the first time, Tivoli Storage Manager binds it to the default management class, to the management class specified in your include-exclude list, or to a management class you specify when modifying your archive options during an archive.

Archived files are never rebound to a different management class. If you change the management class for a file, any previous copies of the file that you archived remain bound to the management class specified when you archived them.

Rebinding Backup Versions of Files

Backups of files are bound again to a different management class in the following conditions. In each condition, the files (active and inactive) are not bound again until the next backup.

- You specify a different management class in an Include statement to change the management class for the file. The backups are managed based on the old management class until you run another backup.
- Your administrator deletes the management class from your active policy set. The default management class is used to manage the backup versions when you back up the file again.
- Your administrator assigns your client node to a different policy domain and the active policy set in that domain does not have a management class with the same name. The default management class for the new policy domain is used to manage the backup versions.

Using a Retention Grace Period

Tivoli Storage Manager also provides a *backup retention grace period* and an *archive retention grace period* to help protect your backup and archive data when it is unable to rebind a file to an appropriate management class. The backup retention grace period is used when:

- You change the management class for a file, but neither the default management class nor the new management class contain a backup copy group.
- The management class to which a file is bound no longer exists, and the default management class does not contain a backup copy group.

The backup retention grace period, defined in your policy domain, starts when you run an incremental backup. The default is 30 days. However, your administrator can lengthen or shorten this period.

When Tivoli Storage Manager manages a file using the backup retention grace period, it does not create any new backup versions of the file. All existing backup versions of the file expire 30 days (or the number of days specified in your policy domain) from the day they are marked inactive.

For archived files, if the management class to which a file is bound no longer exists, and the default management class does not contain an archive copy group, the archive retention grace period defined in your policy domain is used. The default retention period is 60 days. However, your administrator can lengthen or shorten this period.

Chapter 9. Setting Processing Options

You can use defaults for processing options or you can tailor the processing options to meet specific needs. This chapter:
- Provides an overview of processing options.
- Explains how to create and modify a client system options file (`dsm.sys`) and a client user options file (`dsm.opt`).
- Includes an options reference section that provides detailed information about each option.

As a quick reference, this chapter includes instructions for the following tasks:

Task	Page
Creating and Modifying the Client System Options File	107
Creating and Modifying the Client User Options File	108
Setting Options in a File	119
Using Options with Commands	120

Creating and Modifying the Client System Options File

Authorized User

During installation, Tivoli Storage Manager provides a sample client system options file called `dsm.sys.smp`. Use this file to specify one or more servers to contact for services, and the communications options for each server. The file can also include authorization options, backup and archive processing options, and scheduling options.

If you are an authorized user, copy the `dsm.sys.smp` file to `dsm.sys` in your installation directory and modify the required options according to your needs. The following options are required to establish communication with a Tivoli Storage Manager server:

```
SErvername     server1
  COMMMethod                TCPip
  TCPPort                   1500
  TCPServeraddress          node.domain.company.com
```

Use one of the following methods to modify the `dsm.sys` file:
- From the client GUI main window, open the **Utilities** menu and select **Setup Wizard**.
- From the client GUI main window, open the **Edit** menu and select **Preferences**.
- Use your favorite text editor.

If you update the `dsm.sys` file during a session, you must restart the session to pick up the changes.

See "Setting Options in a File" on page 119 for information on how to set options in the `dsm.sys` file.

Note: You *must* name the client system options file `dsm.sys`.

© Copyright IBM Corp. 1993, 2002

Creating and Modifying the Client User Options File

During the installation, Tivoli Storage Manager provides a sample client user options file called `dsm.opt.smp`.

Copy the `dsm.opt.smp` file to `dsm.opt` in your installation directory and modify the required options according to your needs.

This file contains the following options:
- Communication options
- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Format options
- Command processing options
- Authorization options
- Error processing options
- Transaction processing option
- Web client options
- Image-snapshot

If you are a root user, you can create a default client user options file for all users on your workstation. If you want to use different options than those specified in the default client user options file, you can create your own client user options file.

To create and modify a default client user options file or client user options file, follow these steps:
1. Open the **Utilities** menu and select **Setup Wizard**.
2. Select **Create a new options file**.
3. Follow the instructions on the screen.

You can also create and modify a client user options file by performing the following steps:
1. Change to the directory containing the sample file. If necessary, contact the root user on your workstation to determine the location.
2. Copy `dsm.opt.smp` to `dsm.opt` or to a new file name of your choice.
   - **For the default client user options file**: You can store your default client user options file in the same directory as `dsm.sys.smp`, or in any directory for which you have write access.
   - **For the client user options file**: You can rename your client user options file and store it in any directory to which you have write access. Set the DSM_CONFIG environment variable to point to your new client user options file.

     For the Bourne or Korn shell, enter the DSM_CONFIG variable in the .profile file in your $HOME directory. For example:

     ```
     DSM_CONFIG=/home/monnett/dsm.opt
     export DSM_CONFIG
     ```

     For the C shell, add the DSM_CONFIG variable to `.cshrc` in your **$HOME** directory. For example, we recommend that you use full path names instead of relative path names when you set environment variables.

     ```
     setenv DSM_CONFIG /home/monnett/dsm.opt
     ```

3. From the Tivoli Storage Manager GUI, click **Edit** and then click **Preferences** and enter any options that you want to change. See "Client Options Reference" on page 121 for options supported on your platform and detailed information about each option.

   The preferences editor updates the client configuration files, `dsm.opt` and `dsm.sys`, if any options have changed.

   The preferences editor uses the environment variables DSM_DIR to locate the client system options file (`dsm.sys`) and DSM_CONFIG to locate the client user options file (default name `dsm.opt`). The preferences editor queries the server for options on the server, but only updates the client options file. The preferences editor groups the options into the following categories:
   - General
   - Backup
   - Restore
   - Include-Exclude
   - Scheduler
   - Regional Settings
   - Authorization
   - Web client
   - Command line
   - Diagnostics
   - Communication

You may use some options *only* with commands. For more information about these options, see Chapter 10, "Using Options with Commands" on page 231.

Communication Options

You use communication options to specify how your client node communicates with a Tivoli Storage Manager server.

For UNIX use one of the following communication protocols:
- TCP/IP (all UNIX clients)
- Shared Memory (AIX, HP-UX, and Solaris only)

Use the ***commmethod*** option to specify the communication protocol. For more information, see "Commmethod" on page 127.

You can also use the ***lanfreecommmethod*** option to specify the communication protocol in a SAN environment. See "Lanfreecommmethod" on page 167 for more information.

Ask your Tivoli Storage Manager administrator for assistance in setting your communication options.

TCP/IP Options

To use the TCP/IP communication protocol, you must include the ***tcpserveraddress*** option in your client system options file (`dsm.sys`). The other TCP/IP options have default values which you can modify only if you want to change the default value.

For UNIX: If you plan to back up an NFS system, see "Nfstimeout" on page 179.

Table 18. TCP/IP Options

Option	Description	Page
httpport	Specifies a TCP/IP port address for the Tivoli Storage Manager Web client.	159
httpsport	Specifies a TCP/IP port address for the HTTPS secure socket layer (SSL) interface to the Tivoli Storage Manager Web client. This option is valid for the AIX and AIX 5L clients *only*.	160
lanfreetcpport	Specifies the TCP/IP port number where the Tivoli Storage Manager storage agent is listening.	170
tcpbuffsize	Specifies the size, in kilobytes, of the Tivoli Storage Manager internal TCP/IP communication buffer.	213
tcpnodelay	Specifies that Tivoli Storage Manager immediately sends small transactions to the server.This option is for a AIX and AIX 5L clients *only*.	216
tcpport	Specifies the TCP/IP port address for a Tivoli Storage Manager server.	217
tcpserveraddress	Specifies the TCP/IP address for a Tivoli Storage Manager server.	218
tcpwindowsize	Specifies the size, in kilobytes, of the TCP/IP sliding window for your client node.	219
webports	Enables the use of the Web client outside a firewall by specifying the TCP/IP port number used by the Client Acceptor daemon and the Web Client Agent service for communications with the Web GUI.	229

Shared Memory Options

You must install TCP/IP on your workstation to use the shared memory communication method.

Table 19. Shared Memory Communication Options

Option	Description	Page
shmport	Specifies the TCP/IP port address on which the server listens to establish a shared memory connection.	208
lanfreeshmport	Specifies the Shared Memory port number where the Tivoli Storage Manager storage agent is listening. Use this option when you specify ***lanfreecommmethod***=*SHAREdmem* for communication between the Tivoli Storage Manager client and storage agent when processing between the client and the SAN-attached storage device.	169

Server and Node Options

Authorized User

Use the following options to specify the server to contact for backup-archive services, and the client node for which to request backup-archive services.

Server Options

Use the ***servername*** option in your client system options file (`dsm.sys`) to specify the start of a group of options (stanza) used to connect to a Tivoli Storage Manager server. Multiple stanzas can be set up in the `dsm.sys` file to connect to different servers. Each stanza begins with a ***servername*** option and must contain all options required to establish communication with a server. The stanza can also contain other options for backup-archive operations.

If your client system options file contains only one stanza — Your client node contacts the server you specify in that stanza for all services.

If your client system options file contains more than one stanza — You can specify a default server with the ***defaultserver*** option. If you do not specify a default server, by default Tivoli Storage Manager contacts the server you specify in the first stanza of your `dsm.sys` file.

Place the ***defaultserver*** option at the beginning of your dsm.sys file before any server stanzas.

Figure 3 shows a sample client system options file (`dsm.sys`).

```
DEFAULTServer                server2

SErvername     server1
  NODename                   node1
  COMMMethod                 TCPip
  TCPPort                    1500
  TCPServeraddress           almvmd.almaden.ibm.com
  PASSWORDAccess             generate
  MAILprog                   /usr/bin/xsend root
  GRoups                     system adsm
  USERs                      ashton stewart kaitlin
  INCLExcl                   /adm/adsm/backup1.excl

SErvername     server2
  COMMMethod                 SHAREdmem
  shmport                    1520
  PASSWORDAccess             prompt
  GRoups                     system adsm
  USERs                      danielle derek brant
  INCLExcl                   /adm/adsm/backup2.excl
```

Figure 3. Sample Client System Options File

Use the ***servername*** option in the default client user options file (`dsm.opt`) or on the command line to specify a server to contact for backup-archive services. This overrides the default server specified in your client system options file (`dsm.sys`).

Note: You cannot override the migration server specified in the client system options file.

Node Options

You may specify the following node options in your client system options file (`dsm.sys`):

Table 20. Server and Node Options

Option	Description	Page
defaultserver	The name of the Tivoli Storage Manager server to contact for backup-archive services by default if more than one server is defined in the client system options file (`dsm.sys`). Also specifies the server to contact for space management services if you have the HSM client installed and do not specify a server with the ***migrateserver*** option. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794 for more information.	135
clusternode	Specifies whether Tivoli Storage Manager participates in a High Availability Cluster Multi Processing (HACMP) environment.	126
nasnodename	Specifies the node name for the NAS file server.	178
nodename	Specifies the name of your workstation so that you can establish communications with the Tivoli Storage Manager server.	180
servername	In the client system options file (`dsm.sys`), this option specifies the name of a server. In the client user options file (dsm.opt), this option specifies the Tivoli Storage Manager server to contact for services.	206
virtualnodename	Specifies the name of another client node. Use this option if you want to restore or retrieve your files from a Tivoli Storage Manager server to a client node other than the one on which you stored files without storing your password in the registry.	227

Backup and Archive Processing Options

You can use the following options to control some aspects of backup and archive processing.

Table 21. Backup and Archive Processing Options

Option	Description	Page
archsymlinkasfile	Specifies whether you want Tivoli Storage Manager to follow a symbolic link and archive the file or directory it points to, or archive the symbolic link only.	123
automount	The ***automount*** option is used with the ***domain*** option to specify all automounted file systems in the domain that will be mounted when the Tivoli Storage Manager client starts, and included for backup services.	124
changingretries	Specifies the number of retries when attempting to back up or archive a file that is in use.	125
compressalways	Specifies whether to continue compressing an object if it grows during compression, or resend the object uncompressed. This option is used with the ***compression*** option.	130

Table 21. Backup and Archive Processing Options (continued)

Option	Description	Page
compression	Specifies whether to compress files before sending them to the server. **Note:** The ***compression*** option also applies to migrated files if you install the Tivoli Storage Manager HSM client on your workstation.	131
dfsbackupmntpnt	Specifies whether you want Tivoli Storage Manager to see a DFS mount point as a mount point or as a directory.	136
dirmc	Specifies the management class to use for directories. If not specified, Tivoli Storage Manager uses the management class with the longest retention period.	138
domain	Specifies the file systems to include in your default client domain for an incremental backup.	139
domain.image	Specifies the file systems you want to include in your default client domain for an image backup. This option is for AIX, HP/UX, Linux86, and Solaris *only*.	142
domain.nas	Specifies the volumes to include in your default domain for nas backups. This option is for AIX, and Solaris clients *only*.	143
enablelanfree	Specifies whether to enable an available LAN-Free path to a storage area network (SAN) attached storage device.	146
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	*These options are equivalent*. Use these options to exclude a file or group of files from backup services and space management services (if the HSM client is installed).The ***exclude.backup*** option only excludes files from normal backup, but not from HSM.	152
exclude.archive	Excludes a file or group of files from archive services.	152
exclude.compression	Excludes files from compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	152
exclude.dir	Excludes the directory you specify, its files, and all its subdirectories and their files from backup processing.	152
exclude.encrypt	Excludes specified files from encryption processing.	152
exclude.fs	Excludes file spaces matching a pattern. This option is valid for all UNIX clients.	152
exclude.fs.nas	Excludes file systems on the NAS file server from an image backup when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS file servers. The **backup nas** command ignores all other exclude statements including ***exclude.fs*** and ***exclude.dir*** statements. This option is for AIX, and Solaris clients *only*.	152

Table 21. Backup and Archive Processing Options (continued)

Option	Description	Page
exclude.image	Excludes mounted file systems and raw logical volumes that match the pattern from image processing. This option is valid for AIX, HP-UX, Solaris, and Linux86 *only*.	152
guitreeviewafterbackup	Specifies whether the client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	158
inclexcl	Specifies the path and file name of an include-exclude options file.	162
include ***include.backup*** ***include.file***	*These options are equivalent*. Use these options to include files or assign management classes for backup processing.	163
include.archive	Includes files or assigns management classes for archive processing.	163
include.compression	Includes files for compression processing if you specify ***compression***=*yes*. This option applies to backups and archives.	163
include.encrypt	Includes specified files for encryption processing.	163
include.fs.nas	Assigns a management class when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS file servers. The **backup nas** command ignores all other include statements. This option is for AIX, and Solaris clients *only*.	163
include.image	Includes a file space or logical volume or assigns a management class when used with the **backup image** command. The **backup image** command ignores all other include options. This option is valid for AIX, HP-UX, Solaris, and Linux86 *only*.	163
memoryefficientbackup	Specifies a memory-saving backup algorithm for incremental backups when used with the **incremental** command.	177
snapshotcachesize	Use the ***snapshotcachesize*** option with the **backup image** command, the ***include.image*** option, or in your `dsm.sys` file to specify the percent value of the volume that is utilized to create an online image backup. This option is valid for Linux86 client *only*.	209
subdir	Specifies whether to include subdirectories of a named directory.	210
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape required for a backup or archive to be mounted, or whether to prompt you for your choice.	212
virtualmountpoint	Specifies a directory to serve as a virtual mount point for a file system. This provides a direct path to the files you want Tivoli Storage Manager to consider for backup, saving processing time.	225

Restore and Retrieve Processing Options

The following options relate to restore and retrieve processing.

Table 22. Restore and Retrieve Processing Options

Option	Description	Page
followsymbolic	Specifies that you want to restore files to symbolic links, and permit a symbolic link to be used as a virtual mount point.	156
guitreeviewafterbackup	Specifies whether the client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	158
localbackupset	Specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the server to restore a local backup set on a UNIX standalone workstation.	172
replace	Specifies whether to overwrite an existing file, or to prompt you for your selection when you restore or retrieve files.	194
subdir	Specifies whether you want to include subdirectories of a named directory.	210
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape required for a restore or retrieve to be mounted, or to prompt you for your choice.	212

Scheduling Options

You can use the following options to regulate central scheduling. Tivoli Storage Manager uses scheduling options only when the Scheduler is running.

Table 23. Scheduling Options

Option	Description	Page
managedservices	Specifies the services to be managed by the Tivoli Storage Manager Client Acceptor.	174
maxcmdretries	Specifies the maximum number of times the client scheduler attempts to process a scheduled command that fails.	176
postschedulecmd, postnschedulecmd	Specifies a command to process after running a schedule.	188
preschedulecmd, prenschedulecmd	Specifies a command to process before running a schedule.	190
queryschedperiod	Specifies the number of hours the client scheduler waits between unsuccessful attempts to contact the server for scheduled work.	192
retryperiod	Specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails or between unsuccessful attempts to report results to the server.	197
schedcmddisabled	Specifies whether to disable the scheduling of generic commands specified by your Tivoli Storage Manager administrator.	199

Table 23. Scheduling Options (continued)

Option	Description	Page
schedcmduser (server defined only)	The scheduler executes commands under a uid of 0, however, there may be some users who have a different user ID. In this case, your Tivoli Storage Manager administrator can define schedules and allow these schedules to be executed under a uid other than 0, using this option. The Tivoli Storage Manager Client API does not support this option.	96
schedlogname	Specifies the name of the file where schedule log information is stored.	200
schedlogretention	Specifies the number of days to keep log file entries in the schedule log, and whether to save pruned entries.	201
schedmode	Specifies which schedule mode to use, *polling* or *prompted*.	202
tcpclientaddress	Specifies the TCP/IP address of your client node. Use this option only with the **schedule** command when you specify *prompted* as the schedule mode.	214
tcpclientport	Specifies the TCP/IP port number of your client node. Use this option only with the **schedule** command when you specify *prompted* as the schedule mode.	215

Format Options

You can use the following options to select different formats for date, time, and numbers.

Table 24. Format Options

Option	Description	Page
dateformat	Specifies the format for displaying dates.	133
numberformat	Specifies the format for displaying numbers.	182
timeformat	Specifies the format for displaying time.	220

Command Processing Options

The following options apply when you use Tivoli Storage Manager commands.

Table 25. Command Processing Options

Option	Description	Page
editor	Specifies if the command-line interface editor and command retrieve capability is turned on or off.	145
guitreeviewafterbackup	Specifies whether the client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	158
quiet	Specifies that processing information does not display on your screen. This option can be overidden by the server.	193

Table 25. Command Processing Options (continued)

Option	Description	Page
scrolllines	Specifies the number of lines to display at one time when displaying a list of items. Use this option only when ***scrollprompt*** is set to *yes*.	204
scrollprompt	Specifies whether Tivoli Storage Manager stops after displaying the number of lines specified by ***scrolllines***, or it scrolls to the end of the list.	205
verbose	Specifies that processing information should display on your screen. The alternative is ***quiet***. This option can be overridden by the server.	224

Authorization Options

These options control access to a Tivoli Storage Manager server.

Table 26. Authorization Options

Option	Description	Reference
encryptkey	Specifies whether to save the encryption key locally or whether to prompt the user for the encryption key.	148
groups	Specifies the groups on your workstation that you want to authorize to request services from the server.	157
mailprog	Specifies the program and user ID where you want to send a newly generated password when the old one expires.	173
password	Specifies a Tivoli Storage Manager password.	184
passwordaccess	Specifies how Tivoli Storage Manager handles a password if one is required for your workstation.	185
passworddir	Specifies the directory in which you want to store the automatically generated password for your client node. The encryption key and password are encrypted and stored in the `TSM.PWD` file.	187
revokeremoteaccess	Restricts an administrator with client access privileges from accessing your workstation through the Web client.	198
users	Specifies users on your workstation who can request services from a server.	223

Error Processing Options

These options specify the name of the error log file and how Tivoli Storage Manager treats the entries in the log file.

Table 27. Error Processing Options

Option	Description	Page
errorlogname	Specifies the path and name of the error log.	150

Table 27. Error Processing Options (continued)

Option	Description	Page
errorlogretention	Specifies the number of days to keep log file entries in the error log, and whether to save pruned entries.	151

Transaction Processing Options

These options control how Tivoli Storage Manager processes transactions between the client and server.

Table 28. Transaction Processing Options

Option	Description	Page
commrestartduration	Specifies the maximum number of minutes you want the client to try to reconnect to a Tivoli Storage Manager server after a communication error occurs.	128
commrestartinterval	Specifies the number of seconds you want the client to wait between attempts to reconnect to a Tivoli Storage Manager server after a communication error occurs.	129
largecommbuffers	Specifies whether the client will use increased buffers to transfer large amounts of data between the client and the server.	171
nfstimeout	Specifies the amount of time, in seconds, Tivoli Storage Manager waits for an NFS system call response before timing out.	179
resourceutilization	Specifies a threshold (between 1 and 10) for the maximum number of sessions opened between the Tivoli Storage Manager server and client during processing.	195
txnbytelimit	Specifies the number of kilobytes Tivoli Storage Manager can buffer together in a transaction before sending data to the server.	222

Web Client Options

The following are options for the Tivoli Storage Manager Web Client.

Table 29. Web Client Options

Option	Description	Page
httpport	Specifies a TCP/IP port address for the Web client.	159
httpsport	Specifies a TCP/IP Secure Socket Layer (SSL) port address for the Web client. This option is valid for the AIX and AIX 5L clients *only*.	160
managedservices	Specifies whether the Tivoli Storage Manager Client Acceptor daemon manages the Web client, the scheduler, or both.	174
revokeremoteaccess	Restricts administrator access on a client workstation through the Web client.	198

Table 29. Web Client Options (continued)

Option	Description	Page
webports	Enables the use of the Web client outside a firewall by specifying the TCP/IP port number used by the Tivoli Storage Manager Client Acceptor daemon and the Web Client Agent service for communications with the Web GUI.	229

Setting Options in a File

This section describes how to set options in your client system options file (`dsm.sys`) or client user options file `dsm.opt`, and how to use options with commands.

To view or modify an options file, click **Edit** → **Preferences** from the Tivoli Storage Manager client GUI. The preferences editor updates the client configuration options file if any options have changed.

You can also edit an options file with your favorite text editor.

To set an option in these files, enter the option name and one or more blank spaces, followed by the option value. For example:

```
compression  yes
nodename     client_a
```

Some options consist of only the option name, such as ***verbose*** and ***quiet***. You can enter the entire option name or its abbreviation. For example, you can specify the ***verbose*** option as either of the following:

```
verbose
ve
```

Follow these additional rules when entering options in your client user options file (`dsm.opt`):

- Do not enter comments on the same line as an option.
- Indent options with spaces or tabs.
- Begin each comment with an asterisk (*) as the first character in a line.
- Enter each option on a separate line and enter all parameters for an option on the same line. For example, to specify a group of five different file systems as your default client domain, enter:

  ```
  domain /home /mfg /planning /mrkting /mgmt
  ```
- Enter one or more blank spaces between parameters.
- Use blank lines between options.
- The maximum number of characters for a file name is 256. The maximum combined length of the file name and path name is 1024 characters.

If you update the client user options file while a GUI or Web client session is active, you must restart the session to pick up the changes.

Using Options with Commands

You can override some of the options in your options file by entering them with appropriate backup-archive commands. You cannot override options by entering them with HSM commands.

Options are processed in the following order (precedence):

1. Options defined on the server with server-enforced client options. The server overrides client values.
2. Options entered locally on the command line.
3. Options defined on the server for a schedule using the options parameters.
4. Options entered locally in the options file.
5. Options received from the server with client options not enforced by the server. The server *does not* override client values.
6. Default option values.

Tivoli Storage Manager also includes a group of client command options that you can enter *only* on the command line with specific commands. For a complete list of command line options, a description, and where to go in this book for more information, see Chapter 10, "Using Options with Commands" on page 231.

To use an option with a command, enter a dash (–), the option name, an equal sign (=), and the option parameters. For example,

```
dsmc incremental -domain=/home
```

For options that do not include parameters, enter a dash (–) and the option name. For example,

```
dsmc incremental -quiet
```

Note: Use a leading dash (-) to indicate that the following text is the name of an option. If an object name begins with a dash, you must surround it in either single quotes (') or double quotes ("). Most operating system command line processors strip the quotes before submitting the command line arguments to the Tivoli Storage Manager client application. In such cases, using escape characters or doubling the quotes allows the client to receive the quoted object name. In loop mode, surround such objects in either single quotes (') or double quotes (").

You can enter the entire option name or its abbreviation. For information about how to read the syntax diagrams, see "Reading Syntax Diagrams" on page xii.

Entering Options with a Command

Follow these general rules to enter options with a command:

- Enter options before or after command parameters. For example, you can enter the ***subdir*** option before or after a file specification:

  ```
  dsmc selective -subdir=yes "/home/devel/proj1/*"
  dsmc selective "/home/devel/proj1/*" -subdir=yes
  ```

- When entering several options on a command, separate each with a blank space.
- Enclose the value in quotes (" ") if the option value that you enter contains a blank space. For example,

  ```
  dsmc archive -description="Project A" "/home/devel/proj1/*"
  ```

- Any option that you enter on the command line, with the exception of ***domain***, overrides the value set in the client options file. When you use the ***domain***

option with the **incremental** command, it adds to the domain specified in your client options file rather than overriding the current value.

- The maximum number of characters for a file name is 256. The maximum combined length of the file name and path name is 1024 characters.

Client Options Reference

The following sections contain detailed information about each of the Tivoli Storage Manager processing options. Information for each option includes:

- A description of the option.
- A syntax diagram of the option. The option name contains uppercase and lowercase characters. The uppercase characters indicate the minimum abbreviation you can use for the option name. See "Reading Syntax Diagrams" on page xii for an explanation of these diagrams.
- Detailed descriptions of the option parameters. If the parameter is a constant (a value that does not change), use the minimum abbreviation.
- Examples of using the option in the client options file.
- Examples of using the option on the command line (if applicable). Options with a command line example of **Does not apply** cannot be used with command line or scheduled commands.

Note: For options with a **yes** parameter, acceptable alternatives are **1**, **true**, and **on**. For options with a **no** parameter, acceptable alternatives are **0**, **false**, and **off**.

Afsbackupmntpnt

Root User

The ***afsbackupmntpnt*** option specifies whether you want Tivoli Storage Manager to see an AFS mount point as a mount point or as a directory. If Tivoli Storage Manager sees it as a mount point, it backs up only the name of the mounted volume during a backup operation. It does not back up the subtree by starting from the mount point directory. For more information about this option, see "The Afsbackupmntpnt Option" on page 336 in the Appendix.

Supported Clients

This option is valid for all UNIX clients. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file `dsm.sys` or the client user options file `dsm.opt`. Use this option with `dsmafs` and `dsmcafs`.

Syntax

Parameters

Yes
Specifies that Tivoli Storage Manager views all AFS mount points as *mount points* and backs up only the mount point information for any mount point it encounters during a backup operation. This is the default.

No Specifies that Tivoli Storage Manager views all AFS mount points as *directories* and backs up the contents of files and subdirectories of any mount point it encounters during a backup operation.

Examples

Options file:

```
afsbackupmntpnt no
```

Archsymlinkasfile

The ***archsymlinkasfile*** option specifies whether Tivoli Storage Manager follows a symbolic link and archives the file or directory it points to, or archives the symbolic link only. Use this option with the **archive** command.

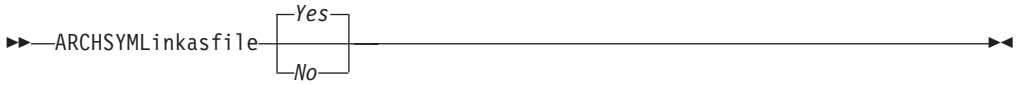
Supported Clients

This option is valid for all UNIX clients. The server can also define this option.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax



Parameters

Yes
Specifies that Tivoli Storage Manager follows a symbolic link and archives the associated file or directory. This is the default.

No Specifies that Tivoli Storage Manager archives the symbolic link and not the associated file or directory.

Examples

Options file:

```
archsymlinkasfile no
```

Command line:

```
-archsyml no
```

Automount

Authorized User

The ***automount*** option adds an automounted file system into the domain by mounting it. Use this option with the ***domain*** option.

Use this option to specify all automounted file systems the Tivoli Storage Manager client tries to mount at the following points in time:
- When Tivoli Storage Manager client starts
- When the back up is started
- When the Tivoli Storage Manager client has reached an automounted file system during backup

It is unnecessary to explicitly specify an automounted file system in the ***automount*** statement if you use the keywords *all-auto-nfs* or *all-auto-lofs* in the domain statement and the file system is already mounted. However, you should add this file system in the ***automount*** statement to ensure the file system has been mounted at all the points in time mentioned above. The automounted file systems are remounted if they have gone offline in the meantime during a backup.

See "Domain" on page 139 for more information about working with Automounted File Systems and the ***domain*** option.

Supported Clients

This option is valid for all UNIX platforms except Linux86 and Linux390. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax

Parameters

filespacename
Specifies one or more automounted file systems that are mounted and added into the domain.

Examples

Options file:

```
automount fs1 fs2
```

Command line:

```
Does not apply.
```

Changingretries

Authorized User

The ***changingretries*** option specifies how many additional times you want the client to attempt to back up or archive a file that is in use. Use this option with the **archive**, **incremental**, and **selective** commands.

Use this option only when *serialization*, an attribute in a management class copy group, is *shared static* or *shared dynamic*.

With *shared static* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. If the file is open during each attempt, the operation does not complete.

With *shared dynamic* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. The backup or archive occurs during the last attempt whether the file is open or not.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

numberretries
Specifies the number of times a backup or archive operation is attempted if the file is in use. The range of values is zero through 4; the default is 4.

Examples

Options file:

```
changingretries 3
```

Command line:

```
-cha=0
```

Clusternode

The ***clusternode*** option specifies whether Tivoli Storage Manager participates in a High Availability Cluster Multi Processing (HACMP) environment. For information on how to configure a cluster server, see Appendix B, "Configuring the Backup-Archive Client in an HACMP Takeover Environment" on page 341.

Supported Clients

This option is valid for the AIX 4.3.3 (or later) client *only*.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

Yes
Specifies that you want to back up cluster resources and participate in cluster failover for high availability.

No Specifies that you do not want the Tivoli Storage Manager client to participate in cluster failover.

Examples

Options file:

```
cluster no
```

Command line:

```
-cluster=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Commmethod

Authorized User

The ***commmethod*** option specifies the communication method you use to provide connectivity for client-server communication.

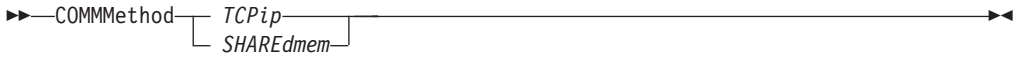
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax



Parameters

TCPip
The Transmission Control Protocol/Internet Protocol (TCP/IP) communication method.

SHAREdmem
Use the Shared Memory communication method when the client and server are running on the same system. This provides better performance over the TCP/IP protocol.

When specifying this communications method on AIX, you must be log in as root or have the same user ID as the process running the server.

Examples

Options file:

```
commm tcp
```

Command line:

```
-commmethod=tcp
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Commrestartduration

Authorized User

The ***commrestartduration*** option specifies the maximum number of minutes you want the client to attempt to reconnect with a server after a communication error occurs.

Note: A scheduled event will continue if the client reconnects with the server before the ***commrestartduration*** value elapses, even if the event's startup window has elapsed.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

minutes
The maximum number of minutes you want the client to attempt to reconnect with a server after a communication failure occurs. The range of values is zero through 9999; the default is 60.

Examples

Options file:

```
commrestartduration 90
```

Command line:

```
Does not apply.
```

Commrestartinterval

Authorized User

The ***commrestartinterval*** option specifies the number of seconds you want the client to wait between attempts to reconnect with a server after a communication error occurs.

Note: Use this option only when ***commrestartduration*** is a value greater than zero.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

seconds
The number of seconds you want the client to wait between attempts to reconnect with a server after a communication failure occurs. The range of values is zero through 65535; the default is 15.

Examples

Options file:

```
commrestartinterval 30
```

Command line:

```
Does not apply.
```

Compressalways

The ***compressalways*** option specifies whether to continue compressing an object if it grows during compression, or resend the object uncompressed. Use this option with the ***compression*** option.

Use the ***compressalways*** option with the **archive**, **incremental**, and **selective** commands.

Note: The server can also define this option.

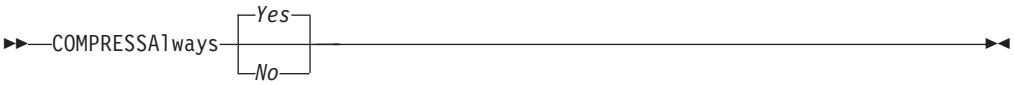
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax



Parameters

Yes
File compression continues even if the file grows as a result of compression. This is the default.

No Backup-archive client objects are resent uncompressed if they grow during compression. API behavior depends on the application. Application backups may fail.

Examples

Options file:

```
compressalways yes
```

Command line:

```
-compressa=no
```

This option is valid only on the initial command line.

Compression

Authorized User

The ***compression*** option compresses files *before* you send them to the server. Compressing your files reduces data storage for backup versions and archive copies of your files. It can, however, affect Tivoli Storage Manager throughput. A fast processor on a slow network connection benefits from compression, but a slow processor on a fast network connection does not.

If you set the ***compressalways*** option to *yes*, compression continues even if the file size increases. To stop compression if the file size grows, and resend the file uncompressed, set the ***compressalways*** option to *No*.

If you set the ***compression*** option to *yes*, you can control compression processing in the following ways:

- Use the ***exclude.compression*** option in your client system options file (dsm.sys) to exclude specific files or groups of files from compression processing. See "Exclude Options" on page 152 for more information.
- Use the ***include.compression*** option in your client system options file (dsm.sys) to include files within a broad group of excluded files for compression processing. See "Include Options" on page 163 for more information.

This option controls compression *only if* your administrator specifies that your client node can compress files before sending them to the server.

Use the ***compression*** option with the **archive**, **incremental**, and **selective** commands.

Note: The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

No Files are not compressed before they are sent to the server. This is the default. For options with a *No* parameter, acceptable alternatives are **0**, **false**, and **off**.

Yes
Files are compressed before they are sent to the server. For options with a *Yes* parameter, acceptable alternatives are **1**, **true**, and **on**.

Examples

Options file:

```
compression yes
```

Command line:

```
-compressi=no
```

Dateformat

The ***dateformat*** option specifies the format you want to use to display dates.

The AIX, AIX 5L, Solaris, and HP-UX clients support locales other than English that describe every user interface that varies with location or language. Solaris and HP-UX clients only support English, Korean, Simplified Chinese, Traditional Chinese, and Japanese locale information. The default directories for system-supplied locales are as follows:

- `/usr/lib/nls/loc` for AIX and AIX 5L
- `/usr/lib/locale` for Solaris
- `/usr/lib/nls/loc/locales` for HP-UX

The backup-archive and administrative clients obtain format information from the locale definition in effect at the time you start the client. Consult the documentation on your local system for details about setting up your locale definition.

Notes:

1. This ***dateformat*** option does not affect the Web client. The Web client uses the date format for the locale that the browser is running in. If the browser is not running in a locale that Tivoli Storage Manager supports, the Web client uses the date format for American English.
2. When you change the date format and use the ***schedlogretention*** option to prune the schedule log, Tivoli Storage Manager removes all entries in the schedule log with a different date format when pruning the log. When you change the date format and use the ***errorlogretention*** option to prune the error log, Tivoli Storage Manager removes all entries in the error log with a different date when pruning the log. When changing the date format, copy the schedule log and error log if you want to preserve log entries that contain a different date format.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax

Parameters

format_number

Displays the date using one of the following formats. Select the number that corresponds to the date format you want to use:

0 Use the locale-specified date format. For AIX, AIX 5L, HP-UX, SGI, and Solaris: This is the default if the locale-specified date format consists of digits and separator characters.

1 MM/DD/YYYY (This is the default)

For AIX, AIX 5L, HP-UX, SGI, and Solaris: This is the default if the locale-specified date format consists of anything but digits and separator characters.

2 DD-MM-YYYY
3 YYYY-MM-DD
4 DD.MM.YYYY
5 YYYY.MM.DD

For AIX, AIX 5L, HP-UX, SGI, and Solaris: To set a particular date format, edit the source file for your locale and modify the **d_fmt** line to support your needs. Whatever date format you select applies both to output and to input; however, the input year can be either 2 or 4 digits.

"**%m/%d/%y**"
Displays the date in the form MM/DD/YY

"**%d.%m.%Y**"
Displays the date in the form DD.MM.YYYY

Examples

Options file:

```
dateformat 3
```

Command line:

```
-date=4
```

This option is valid on the initial command line and in interactive mode. If you use this option in interactive mode, it remains in effect for the entire interactive session or until you enter another ***dateformat*** option.

Defaultserver

Authorized User

The ***defaultserver*** option specifies the default server to which you want to back up or archive files from your local systems.

If you have the HSM client installed on your workstation, and you do not specify a migration server with the ***migrateserver*** option, use this option to specify the server to which you want to migrate files. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients* for more information.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option *at the beginning* of the client system options file (`dsm.sys`) *before* any server stanzas.

Syntax

Parameters

servername
Specifies the name of the default server to which you back up or archive files. The server to which files are migrated from your local file systems can also be specified with this option. You can use this option if you do not specify a migration server with the ***migrateserver*** option.

Examples

Options file:

```
defaults server_a
```

Command line:

```
Does not apply.
```

Dfsbackupmntpnt

Root User

The ***dfsbackupmntpnt*** option specifies whether you want Tivoli Storage Manager to see a DFS mount point as a mount point or as a directory. If Tivoli Storage Manager sees it as a mount point, it backs up only the name of the mounted fileset during a backup operation. It does not back up the subtree by starting from the mount point directory.

For more information on using the ***dfsbackupmntpnt*** option, see "The Dfsbackupmntpnt Option" on page 337 in the Appendix.

Supported Clients

This option is valid for all UNIX cients.

Options File

Place this option in the client system options file (`dsm.sys`) *within* a server stanza, or in the client options file (`dsm.opt`). Use this option with the `dsmdfs` and `dsmcdfs` client programs.

Syntax

Parameters

Yes
Specifies that Tivoli Storage Manager views all DFS mount points as *mount points* and backs up only the name of the mounted fileset for any mount point it encounters during a backup operation. This is the default.

No Specifies that Tivoli Storage Manager views all DFS mount points as *directories* and backs up the contents of files and subdirectories of any mount point it encounters during a backup operation.

Examples

Options file:

```
dfsbackupmntpnt no
```

Dfsinclexcl

Root User

If you use a DFS include-exclude options file, the ***dfsinclexcl*** option specifies the path and file name. You can use a DFS include-exclude options file to exclude DFS files or directories from backup. You can use a DFS include-exclude options file to assign different management classes to specific files or groups of files.

A DFS include-exclude options file pointed to by the ***dfsinclexcl*** option is used *only* when DFS files are examined for backup. For more information about setting DFS processing options, see "Setting Processing Options" on page 339 in the Appendix.

Attention: A separate DFS include-exclude options file is required because the prefix **/...** means the global root in DFS. In a DFS include-exclude options file, the **/...** prefix is interpreted as the global root of DFS, while a non-DFS include-exclude option uses the /... prefix to match zero or more directories.

Supported Clients

This option is valid for all UNIX cients. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

filespec
The *filespec* parameter specifies the path and file name of your DFS include-exclude options file.

Examples

Options file:

```
dfsinclexcl /usr/lpp/adsm/bin/backup.excl.dfs
```

Dirmc

Authorized User

The ***dirmc*** option specifies the management class you want to use for directories. If you do not specify this option to associate a management class with directories, the client program uses the management class in the active policy set of your policy domain with the longest retention period. Select a management class for individual directories that retains directories at least as long as it retains the files associated with them.

If you specify a management class with this option, all directories specified in a backup operation are bound to that management class.

The ***dirmc*** option specifies the management class of directories you back up and does not effect archived directories. Archived directories are always bound to the default management class.

The server can also define this option.

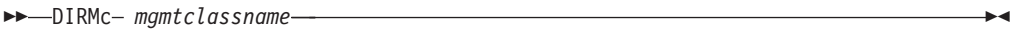
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza..

Syntax



Parameters

mgmtclassname
Specifies the name of the management class you want to associate with directories. The client uses the management class name that you specify for all directories that you back up. If you do not specify this option, the client associates the management class with the longest retention period with directories.

Examples

Options file:

```
dirm managdir
```

Command line

```
Does not apply.
```

Domain

The ***domain*** option specifies the file systems that you want to include for incremental backup in your client domain.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Use the ***domain*** option in your client system options file to define your default client domain. Tivoli Storage Manager uses your default client domain in the following situations to determine which file systems to process during an incremental backup:

- When you run an incremental backup using the **incremental** command and you do not specify which file systems to process.
- When your administrator defines a schedule to run an incremental backup for you, but does not specify which file systems to process.

If you do not use the ***domain*** option to specify file systems in your client options file, Tivoli Storage Manager uses the *all-local* parameter as the default.

Note: You can include a virtual mount point in your client domain. For information about defining a virtual mount point, see "Virtualmountpoint" on page 225.

When you use the ***domain*** option with the **incremental** command, Tivoli Storage Manager adds file systems that you specify to the file system defined in your client options file. For example, if you enter the following in your client options file:

```
domain /home /usr /datasave
```

and the following on the command line:

```
dsmc incremental -domain="/fs1 /fs2"
```

Tivoli Storage Manager performs an incremental backup for your `/home`, `/usr`, `/datasave`, `/fs1`, and `/fs2` file systems .

If you use both a file specification and the ***domain*** option with the **incremental** command, Tivoli Storage Manager ignores the ***domain*** option and processes only those file systems that you specify in the file specification. For example, if you enter:

```
dsmc incremental /fs1 /fs2 -domain="/fs3 /fs4"
```

.

Tivoli Storage Manager performs an incremental backup for the `/fs1` and `/fs2` file systems *only*.

Attention: If you are running GPFS for AIX in a multi-node cluster, and all nodes share a mounted GPFS file system, Tivoli Storage Manager processes this file system as a local file system. Tivoli Storage Manager backs up the file system on each node during an incremental backup. To avoid this, you can do *one* of the following:

- Explicitly configure the ***domain*** statement in the client system options file to list the file systems you want that node to back up.
- Set the ***exclude.fs*** option in the client system options file to exclude the GPFS file system from backup services.

Automounted File Systems

When performing a backup with the ***domain*** option set to *all-local*, files handled by automounter and loopback file systems are not backed up.

When performing a file system backup with the ***domain*** option set to *all-local*, any subdirectories that are mount points for an automounted file system (autofs) are excluded from backup when the automounter has mounted these mount points. Any files that exist on the server for the automounted subdirectory are expired.

When performing a backup with the ***domain*** option set to *all-lofs*, all explicit loopback file systems (lofs) are backed up and all automounted file systems are excluded. For loopback file systems handled by automounter, set the ***domain*** option to *all-auto-lofs*.

You should use the ***automount*** option with the ***domain*** option to specify one or more automounted file systems to be mounted and added into the domain. The automounted file systems are remounted if they have gone offline in the meantime by using the ***automount*** option. See "Automount" on page 124 for more information.

Virtual mount points cannot be used with automounted file systems.

For HP-UX: The ***domain*** option is enhanced with the new keywords *all-auto-lofs* and *all-auto-nfs* to support automounted file systems. To use this enhancement, set the *autofs* parameter to 1 in the `/etc/rc.config.d/nfsconf` file. Changing this parameter requires a reboot. For further information please refer to the HP documentation on this issue.

The following UNIX platforms support automounter, LOFS, or LOFS through automounter, as indicated:

Platform	automounter	LOFS	LOFS through automounter
AIX and AIX 5L	yes	yes	yes
Solaris	yes	yes	yes
HP-UX	yes	yes	no
SGI	yes	no	yes
OS/390 UNIX	yes	no	no

Notes:

1. The Linux clients are not enabled for automounter support.
2. The Linux operating system does not support loopback file systems (LOFS). Instead a loop device is available to allow devices or files mounted as whole file systems. Loop devices are supported by the Tivoli Storage Manager Linux

clients in the same way as loopback file systems for other UNIX operating systems. They are not part of the local domain, but domain LOFS. You must use the ***domain*** option to add them to your domain.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` or the client user options file `dsm.opt`.

Syntax

Parameters

all-local
Backs up all local file systems except LOFS file systems and LOFS through automounter. This is the default.

The `/tmp` directory is not included.

domain
Defines the file systems to include in your default client domain.

When you use ***domain*** with the **incremental** command, it processes these file systems in addition to those you specify in your default client domain.

all-lofs
Backs up all loopback file systems, except those handled by automounter.

all-nfs
Backs up all network file systems, except those handled by automounter.

all-auto-nfs
Backs up all network file systems which are handled by automounter.

all-auto-lofs
Backs up all loopback file systems which are handled through automounter.

Examples

Options file:

```
domain /tst /datasave /joe
"domain all-local"
```

Command line:

```
-domain=""/fs1 /fs2""
-domain=/tmp
```

Domain.image

The ***domain.image*** option specifies the mounted file systems and raw logical volumes that you want to include in your client domain for an image backup. Raw logical volumes must be named explicitly.

If you do not specify a file system with the **backup image** command, the file systems you specify with the ***domain.image*** option are backed up.

When you specify a file system with the **backup image** command, the ***domain.image*** option is ignored.

If you do not use the ***domain.image*** option to specify file systems in your client options file, and you do not specify a file system with the **backup image** command, a message is issued and no backup occurs.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, Linux86, Solaris *only*.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

domain
Defines the file systems or raw logical volumes to include in your default client image domain.

Examples

Options file:

```
domain.image /fs1 /fs2
```

Command line:

```
Does not apply.
```

Domain.nas

The ***domain.nas*** option specifies the volumes to include in your NAS image backups. You can specify *all-nas* to include all the mounted file systems on the NAS file server, except those you exclude with the ***exclude.fs.nas*** option. When you use this option in your client system options file (`dsm.sys`), the ***domain.nas*** option defines your default domain for NAS image backups.

Tivoli Storage Manager uses your domain for NAS image backups when you run a **backup nas** command and you do not specify which volumes to process.

When you perform a NAS file system image backup using the **backup nas** command, Tivoli Storage Manager adds volumes that you specify on the command line to the volumes defined in your `dsm.sys` file. For example, if you enter the following in your `dsm.sys` file:

```
domain.nas nas1/vol/vol0 nas1/vol/vol1
```

and you enter the following on the command line

```
dsmc backup nas -nasnodename=nas1 /vol/vol2
```

Tivoli Storage Manager performs a backup for the following volumes on node `nas1`: `vol/vol0`, `vol/vol1`, and `vol/vol2`.

When performing a backup, if you use a file specification and set the ***domain.nas*** option to *all-nas* in the `dsm.sys` file, *all-nas* takes precedence. Tivoli Storage Manager processes all mounted volumes on the NAS file server.

Note: The server can also define this option.

Supported Clients

This option is valid for AIX, AIX 5L, and Solaris clients *only*.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

domain
Defines the volumes you want to process.

all-nas
Processes all mounted volumes on the NAS file server, except those you exclude with the ***exclude.fs.nas*** option. This is the default.

Examples

Options file:

```
domain.nas nas1/vol/vol0 nas1/vol/vol1
domain.nas all-nas
```

Command line:

Does not apply.

Editor

The ***editor*** option turns the command line interface (CLI) editor and retrieve capability on or off.

If the editor and command retrieve functions are not working on a specific workstation setting, we recommend that you turn off this function.

Supported Clients

This option is valid for all UNIX (except OS/390 UNIX System Services) clients.

Options File

Place this option in the client system options file `dsm.sys` *or* the client options file `dsm.opt`.

Syntax

Parameters

Yes
Turns on the CLI editor and command retrieve capability. This is the default.

No Turns off the CLI editor and command retrieve capability.

Note: The editor is not supported on OS/390 UNIX System Services, so the ***editor*** option should be set to *No*.

Examples

Options file:

```
editor yes
```

Command line:

```
-editor=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Enablelanfree

Authorized User

The ***enablelanfree*** option specifies whether to enable an available LAN-Free path to a storage area network (SAN) attached storage device. A LAN-Free path allows backup, restore, archive, and retrieve processing between the Tivoli Storage Manager client and the SAN-attached storage device.

To support LAN-Free data movement you must install and configure the Tivoli Storage Manager Managed System for SAN Storage Agent on the client workstation. For more information, refer to the following publications:

- *Tivoli Storage Manager for AIX Managed System for SAN Storage Agent User's Guide*, GC32-0771
- *Tivoli Storage Manager for Sun Solaris Managed System for SAN Storage Agent User's Guide*, GC32-0781
- *Tivoli Storage Manager for HP-UX Managed System for SAN Storage Agent User's Guide*, GC32-0727

Notes:

1. If you place the ***enablelanfree*** option in the client option file (`dsm.opt`), but zero (0) bytes were transferred through the SAN during an operation, ensure that you bind the data to a lanfree enabled management class.
2. The ***enablelanfree*** option is not valid if HSM is installed. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794 for more information.

To specify a communication protocol between the Tivoli Storage Manager client and Storage Agent, see "Lanfreecommmethod" on page 167 for more information.

Note: To restore backup sets in a SAN environment, see "Restore Backupset" on page 318 for more information.

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

Yes
Specifies that you want to enable an available LAN-Free path to a SAN-attached storage device.

No Specifies that you do not want to enable a LAN-Free path to a SAN-attached storage device. This is the default.

Examples

Options file:

```
enablelanfree yes
```

Command line:

```
-enablelanfree=yes.
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Encryptkey

Authorized User

The ***encryptkey*** option specifies whether to save the encryption key password locally when performing a backup-archive operation or whether to prompt for the encryption key password. The encryption key password is saved to the TSM.PWD file in encrypted format.

If you set the ***encryptkey*** option to *save*, you are only prompted the first time you perform an operation. Thereafter, Tivoli Storage Manager does not prompt for the password.

Note: The Web client saves the encryption key password in the TSM.PWD file. If you do not save the encryption key password, you are prompted for the initial encryption key password when you begin encryption processing.

Table 30 shows how both Authorized Users and non-Authorized Users can encrypt or decrypt data during a backup or restore operation depending on the value you specify for the ***passwordaccess*** option. The TSM.PWD file must exist to perform the following Authorized User and non-Authorized User operations. The Authorized User creates the TSM.PWD file and sets the ***encryptkey*** option to*save* and the ***passwordaccess*** option to *generate*.

Table 30. Encrypting or Decrypting Data

Operation	Passwordaccess Option	Encryptkey Option	Result
Authorized User Backup	generate	save	data encrypted
	generate	prompt	data encrypted
	prompt	prompt	data encrypted
	prompt	save	data not encrypted
Authorized User Restore	prompt	save	prompted for encryptkey password and data decrypted
Non-Authorized User Backup	generate	prompt	data not encrypted
	generate	save	data encrypted
	prompt	prompt	data not encrypted
	prompt	save	data not encrypted
Non-Authorized User Restore	generate	prompt	menu to skip or proceed
	generate	save	data decrypted
	prompt	prompt	menu to skip or proceed
	prompt	save	menu to skip or proceed

Supported Clients

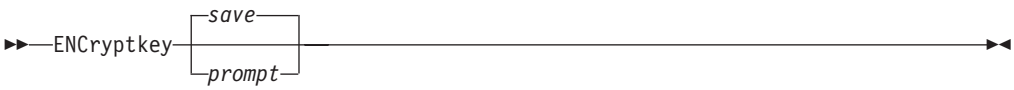
This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`

`dsm.opt`.

Syntax



Parameters

save
Specifies that you want to save the encryption key password to a local TSM.PWD file. If you set the ***encryptkey*** option to *save*, you are only prompted the first time you perform an operation. Thereafter, Tivoli Storage Manager does not prompt for the password. This is the default.

prompt
Tivoli Storage Manager prompts for the password for each backup, archive, and restore operation.

Examples

Options file:

```
encryptkey prompt
```

Command line:

```
-encryptkey=prompt
```

Errorlogname

Authorized User

The ***errorlogname*** option specifies the fully qualified path and file name of the file where you want to store information about errors that occur during processing. The value for this option overrides the DSM_LOG or DSM_DIR environment variables. The `dsmwebcl.log` and `dsmsched.log` files will be created in the same directory as `dsmerror.log`.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

filespec

The fully qualified path and file name where you want to store error log information. Ensure that all directories and subdirectories in the path exist and are accessible by client processing. Tivoli Storage Manager will not create directories for you.

The default is the path indicated by the DSM_LOG or DSM_DIR environment variable. If DSM_LOG or DSM_DIR are not specified, the `dsmerror.log` file will reside in the current working directory.

The `dsmerror.log` file *cannot* be a symbolic link.

Examples

Options file:

```
errorlogname /tmp/tsmerror.log
```

Command line:

```
-errorlog=/home/temp/dsmerror.log
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Errorlogretention

Authorized User

The ***errorlogretention*** option specifies how many days to maintain error log entries before pruning, and whether to save the pruned entries. The error log is pruned when the first error is written to the log after a Tivoli Storage Manager session is started. If the only session you run is the client scheduler, and you run it twenty-four hours a day, the error log might not be pruned according to your expectations. Stop the session and start it again to prune the error log when the next error is written.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

N or *days*
Specifies how long to wait before pruning the error log.

N Do not prune the error log. This permits the error log to grow indefinitely. This is the default.

days
The number of days to keep log file entries before pruning the log. The range of values is zero through 9999.

D or *S*
Specifies whether to save the pruned entries. Enter a space or comma to separate this parameter from the previous one.

D Discard the error log entries when you prune the log. This is the default.

S Save the error log entries when you prune the log.

The pruned entries are copied from the error log to the dsmerlog.pru file located in the same directory as the error log.

Examples

Options file:

```
errorlogretention 400 S
```

Command line:

```
-errorlogr=400,S
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Exclude Options

Authorized User

The exclude options exclude objects from backup, image, or archive services. For example, you might want to exclude all temporary files, any local caches of network files, all files that contain compiled object code that you can easily reproduce using other methods, or your operating system files.

You can exclude specific files from encryption processing during a backup.

Notes:

1. With the exception of ***exclude.fs***, when you exclude a file that was previously included, existing backup versions become inactive during the next incremental backup.
2. The server can define exclude options with the ***inclexcl*** option.

Exclude any system files or images that could corrupt the operating system when recovered. You should also exclude the client directory containing the client files.

Use wildcard characters to exclude a broad range of files. See "Including and Excluding Groups of Files" on page 33 for a list of wildcard characters that you can use. Then, if necessary, use the ***include*** option to make exceptions.

To exclude an entire directory called `any/test`, enter the following:

```
exclude.dir /any/test
```

To exclude subdirectories that begin with `test` under the `any` directory, enter the following:

```
exclude.dir /any/test*
```

Attention: See "Excluding System Files" on page 32 for a list of files that you should always exclude.

Compression Processing

If you want to exclude specific files or groups of files from compression processing during a backup or archive operation, consider the following:

- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See "Compression" on page 131 for more information.

  If you set the ***compression*** option to *yes* and no ***exclude.compression*** statements exist, Tivoli Storage Manager considers all files for compression processing.
- Tivoli Storage Manager processes ***exclude.fs, exclude.dir,*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***exclude.compression*** statements. For example, consider the following include-exclude list:

  ```
  exclude /home/jones/proj1/*.*
  exclude.compression /home/jones/proj1/file.txt
  include /home/jones/proj1/file.txt
  ```

  Tivoli Storage Manager examines the statements (reading from bottom to top) and determines that `/home/jones/proj1/file.txt` is a candidate for back up.

Tivoli Storage Manager then examines the `exclude.compression /home/jones/proj1/file.txt` statement and determines that it is not a candidate for compression processing.

- Include-exclude compression processing is valid for backup and archive processing *only*.

Processing NAS File Systems

Use the ***exclude.fs.nas*** option to exclude file systems from Network Attached Storage (NAS) image backup processing.

A NAS file system specification uses the following conventions:

- NAS nodes represent a new node type. The NAS node name uniquely identifies a NAS file server and its data to Tivoli Storage Manager. You can prefix the NAS node name to the file specification to specify the file server to which the exclude statement applies. If you do not specify a NAS node name, the file system you specify applies to all NAS file servers.
- Regardless of the client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.
- You cannot use wildcards with ***exclude.fs.nas*** and ***include.fs.nas*** statements.

For example, to exclude the `/vol/vol1` file system of a NAS node called `netappsj`, specify the following exclude statement:

```
exclude.fs.nas netappsj/vol/vol1
```

To exclude `/vol/vol1` from backup services on all NAS nodes, specify the following exclude statement:

```
exclude.fs.nas /vol/vol1
```

Supported Clients

This option is valid for all UNIX clients.

Options File

Place these options in the client system options file `dsm.sys`.

Syntax

exclude, exclude.backup, exclude.file, exclude.file.backup
These options are equivalent. Use these options to exclude a file or group of files from backup services and space management services (if the HSM client is installed). The ***exclude.backup*** option only excludes files from normal backup, but not from HSM.

exclude.archive
Excludes a file or a group of files that match the pattern from archive services *only*.

exclude.compression
Excludes files from compression processing if the ***compression*** option is set to *yes*. This option applies to backups and archives.

exclude.dir
Excludes a directory, its files, and all its subdirectories and their files from

backup processing. For example, `exclude.dir /test/dan/data1` excludes `/test/dan/data1`, its files, and all its subdirectories and their files.

However, you can still back up `/test/dan/data1`, its files, and all its subdirectories and their files using a selective backup, as follows:

```
dsmc sel -subdir=yes /test/dan/data1/
```

However, the next time you perform an incremental backup, these backup versions are expired. If you exclude a directory that was previously included, Tivoli Storage Manager marks existing backup versions of the files and directories beneath it inactive during the next incremental backup. Use this option to exclude a portion of your data in which no underlying files need to be backed up. The Tivoli Storage Manager Client API does not support this option.

exclude.encrypt
Excludes the specified files from encryption processing.

exclude.fs
Excludes file spaces matching the pattern. The client does not consider the specified file space for processing and the usual deleted-file expiration process cannot occur. If you exclude a file space that was previously included, existing backup versions remain on the server subject to retention rules specified in the associated management class definition.

exclude.fs.nas
Excludes file systems on the NAS file server from an image backup when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS file servers. The **backup nas** command ignores all other exclude statements including ***exclude.fs*** and ***exclude.dir*** statements. This option is for AIX, AIX 5L, and Solaris clients *only*.

exclude.image
Excludes mounted file systems and raw logical volumes that match the pattern from image processing. This option is valid for AIX, AIX 5L, HP-UX, Linux86, and Solaris *only*.

Parameters

pattern
Specifies the file or group of files that you want to exclude. End the pattern with a file specification.

Note: For NAS file systems: You must prefix the NAS node name to the file specification to specify the file server to which the exclude statement applies. If you do not specify a NAS node name, the file system identified refers to the NAS nodename specified in the client system options file (`dsm.sys`) or on the command line.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

For the ***exclude.image*** option, the pattern is the name of a mounted file system or raw logical volume.

Examples

Options file:

```
exclude /unix/
exclude /.../core
exclude /home/jones/proj1/*
exclude.archive /.../core
exclude.backup /home/jones/proj1/devplan/
exclude.dir /home/jones/tmp
exclude.backup /users/home1/file1
exclude.image /usr/*/*
exclude.encrypt /users/home2/file1
exclude.compression /home/gordon/proj1/*
exclude.fs.nas  netappsj/vol/vol0
```

Command line:

Does not apply.

Followsymbolic

The ***followsymbolic*** option specifies whether you want to restore files to symbolic links or use a symbolic link as a virtual mount point. Use this option with the **restore** and **retrieve** commands.

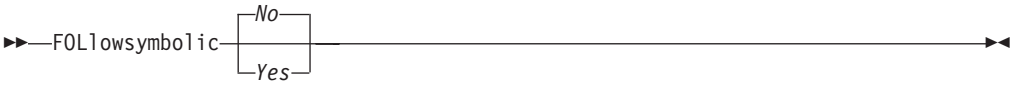
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax



Parameters

No Specifies that you do not want to restore to symbolic links, or to use symbolic links as virtual mount points. This is the default.

Yes
Specifies that you want to restore to symbolic links, or to use a symbolic link as a virtual mount point.

Examples

Options file:

```
followsymbolic Yes
```

Command line:

```
-fol=Yes
```

Groups

Authorized User

The ***groups*** option specifies groups on your workstation that you want to authorize to request Tivoli Storage Manager services from the server. You can use the ***groups*** option more than once to specify several group names.

If you do not specify group names with the ***groups*** option, or user IDs with the ***users*** option, *all* users can request Tivoli Storage Manager services. If you use both the ***groups*** option and the ***users*** option, only users specified with these options can request Tivoli Storage Manager services. A root user is always authorized to request services.

Supported Clients

This option is valid for all UNIX clients. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

groupname
Specifies the name of a group you want to authorize to request Tivoli Storage Manager services.

Examples

Options file:

```
groups  dsmcdev  group1  test1  test2  design1
groups  endicott almaden qadev qadev1 tools23
```

Command line:

```
Does not apply.
```

Guitreeviewafterbackup

The ***guitreeviewafterbackup*** option specifies whether the client returns to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt` *or* the client system options file `dsm.sys`.

Syntax

Parameters

No Returns you to the Tivoli Storage Manager main window after a successful operation completes. This is the default.

Yes
Returns you to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Examples

Options file:

```
guitreeviewafterbackup yes
```

Command line:

```
Does not apply.
```

Httpport

Authorized User

The ***httpport*** option specifies a TCP/IP port address for the Web client.

Note: The Tivoli Storage Manager Client API does not support this option.

Tivoli Storage Manager Firewall Support

The ***webports*** option enables the use of the Web client outside a firewall by specifying the TCP/IP port number used by the Tivoli Storage Manager Client Acceptor daemon and Web Client Agent service for communications with the Web GUI.

The ports you specify with the ***webports*** option and the client option ***httpport*** must be opened in the firewall.

To enable the backup-archive client, Command Line Admin client, and the Scheduler (running in polling mode) to run outside a firewall, the port specified by the server option ***tcpport*** (default 1500) must be opened in the firewall.

Note: Tivoli Storage Manager does not support the scheduler running in *prompted* mode outside a firewall.

See "Tcpport" on page 217 and "Webports" on page 229 for more information. See "Tivoli Storage Manager Firewall Support" on page 47 for further considerations regarding Tivoli Storage Manager firewall support.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

port_address
Specifies the TCP/IP port address that is used to communicate with the Web client. The range of values is 1000 through 32767; the default is 1581.

Examples

Options file:

```
httpport 1502
```

Command line:

```
Does not apply.
```

Httpsport

Authorized User

The ***httpsport*** option specifies a TCP/IP port address for the HTTPS secure socket layer (SSL) interface to the Web client.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for the AIX and AIX 5L clients *only*.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

port_address
Specifies the TCP/IP port address that is used by the HTTPS secure socket layer (SSL) interface to communicate with the Web client. The range of values is 0 and 1000 through 32767; the default is 0 which disables HTTPS.

Examples

Options file:

```
httpsport 1548
```

Command line:

```
Does not apply.
```

Imagetype

Authorized User

Use the ***imagetype*** option with the with the **backup image** command or the ***include.image*** option to specify the type of image backup you want to perform.

Place the ***include.image*** statement containing the ***imagetype*** value in your client system options file dsm.sys.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for AIX, AIX5L, Solaris, HP-UX, and Linux86 clients *only*.

Syntax

Parameters

value
Specifies one of the following values:

snapshot
Specifies that you want to perform an *online* image backup during which the volume is available to other system applications. This is the default for file systems residing on a logical volume created by the Linux Logical Volume Manager. Valid for Linux86 *only*.

dynamic
Replaces the dependency on the Copy Serialization value in the management class to perform an image backup without unmounting and remounting the file system read-only. Use this option only if the volume cannot be unmounted and remounted read-only. Tivoli Storage Manager backs up the volume *as is* without remounting it read-only. Corruption of the backup may occur if applications write to the volume while the backup is in progress. In this case, run **chkdsk** after a restore.

static
Replaces the dependency on the Copy Serialization value in the management class. Specifies that you want to perform an offline image backup during which the volume is unmounted and remounted read only. This is the default for AIX, AIX5L, Solaris, and HP-UX. Valid for AIX, AIX5L, Solaris, HP-UX, and Linux86 only.

Examples

Options file:

```
include.image /home MYMC imagetype=static
```

Command line:

```
-imagetype=static
```

Inclexcl

Authorized User (UNIX requires access authority.)

The ***inclexcl*** option specifies the path and file name of an include-exclude options file. Place the ***inclexcl*** option in the include-exclude list in your client system options file `dsm.sys`.

Multiple inclexcl statements are permitted. However, you must specify this option for each include-exclude file.

Ensure that you store your include-exclude options file in a directory to which all users have read access. Ensure that your include-exclude options file is stored in a directory such as `/etc`.

When processing occurs, the include-exclude statements within the include-exclude file are placed in the list position occupied by the ***inclexcl*** option, in the same order, and processed accordingly.

If you have the HSM client installed on your workstation, you can use an include-exclude options file to exclude files from backup and space management, from backup only or from space management only.

For more information about creating an include-exclude options file, see "Creating an Include-Exclude List (Optional)" on page 29.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

filespec
Specifies the path and file name of *one* include-exclude options file.

Examples

Options file:

```
inclexcl /usr/dsm/backup.excl
inclexcl /etc/inclexcl.def
```

Command line:

```
Does not apply.
```

Include Options

Authorized User

The include options specify one of the following:

- Objects within a broad group of excluded objects that you want to include for backup, archive, image, and space management services, if you have the HSM client installed.
- Files within a broad group of excluded files that you want to include for encryption processing.
- Files within a broad group of excluded files that you want to include for compression processing.
- Objects to which you want to assign a specific management class and a management class name.
- A management class to assign to all objects to which you do not explicitly assign a management class.

If you do not assign a specific management class to objects, Tivoli Storage Manager uses the default management class in the active policy set of your policy domain.

Notes:

1. The ***exclude.fs*** and ***exclude.dir*** statements override all include statements that match the pattern.
2. The server can also define these options with the ***inclexcl*** option.

Compression Processing

If you want to include specific files or groups of files for compression processing during a backup or archive operation, consider the following:

- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See "Compression" on page 131 for more information.
- Tivoli Storage Manager processes ***exclude.fs***, ***exclude.dir,*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***include.compression*** statements. For example, consider the following include-exclude list:

  ```
  include.compression /home/jones/proj1/file.txt
  exclude /home/jones/proj1/file.txt
  ```

  Tivoli Storage Manager examines the `exclude /home/jones/proj1/file.txt` statement first and determines that `/home/jones/proj1/file.txt` is excluded from processing and is not a candidate for compression processing.
- Include-exclude compression processing is valid for backup and archive processing *only*.

Processing NAS File Systems

Use the ***include.fs.nas*** option to bind a management class to Network Attached Storage (NAS) file systems for backup processing.

A NAS file system specification uses the following conventions:

- NAS nodes represent a new node type. The NAS node name uniquely identifies NAS file server and its data to Tivoli Storage Manager. You can prefix the NAS node name to the file specification to specify the file server to which the include statement applies. If you do not specify a NAS node name, the file system you specify applies to all NAS file servers.

- Regardless of the client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.
- You cannot use wildcards with ***include.fs.nas*** and ***exclude.fs.nas*** statements.

For example, to assign a management class to the `/vol/vol1` file system of a NAS node called `netappsj`, specify the following include statement:

```
include.fs.nas netappsj/vol/vol1 nasMgmtClass
```

See "Creating an Include-Exclude List (Optional)" on page 29 for more information.

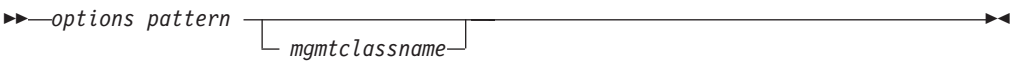
Supported Clients

This option is valid for all UNIX clients.

Options File

Place these options in the client system options file `dsm.sys`.

Syntax



include, include.backup, include.file
These options are equivalent. Use these options to include files or assign management classes for backup processing.

include.archive
Includes files or assigns management classes for archive processing.

include.compression
Includes files for compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.

include.encrypt
Includes the specified files for encryption processing. By default, Tivoli Storage Manager does not perform encryption processing.

include.fs.nas
Assigns a management class when used with the **backup nas** command. If you do not specify a NAS node name, the file system identified applies to all NAS file servers. The **backup nas** command ignores all other include statements. This option is for AIX, AIX 5L, and Solaris clients *only*.

include.image
Includes a file space or logical volume, or assigns a management class when used with the **backup image** command. The **backup image** command ignores all other include options. This option is valid for AIX, AIX 5L, HP-UX, Solaris, and Linux86 *only*.

The ***include.image*** option will accept the following values:

imagetype

snapshot
Specifies that you want to perform an *online* image backup during which the volume is available to other system applications. This is the

default for file systems residing on a logical volume created by the Linux Logical Volume Manager. Valid for Linux86 *only*.

dynamic
Replaces the dependency on the Copy Serialization value in the management class to perform an image backup without unmounting and remounting the file system read-only. Use this option only if the volume cannot be unmounted and re-mounted read-only. Tivoli Storage Manager backs up the volume *as is* without remounting it read-only. The backup may be corrupted if applications write to the volume while the backup is in progress. This may be corrected by running **chkdsk** after a restore. Valid for AIX, AIX5L, Solaris, HP-UX, and Linux86 *only*.

static
Replaces the dependency on the Copy Serialization value in the management class.Specifies that you want to perform an *offline* image backup during which the volume is unmounted and remounted read only. This is the default for AIX, AIX5L, Solaris, and HP-UX. Valid for AIX, AIX5L, Solaris, HP-UX, and Linux86 only.

snapshotcachesize
Specifies an appropriate snapshot size so that all old data blocks can be stored during an online image backup. A snapshot size of 100 percent will ensure a valid snapshot. See "Snapshotcachesize" on page 209 for more information. Valid for Linux86 *only*.

Parameters

pattern
Specifies the objects to include for backup or archive processing or to assign a specific management class. End the pattern with a file specification.

Note: For NAS file systems: You must prefix the NAS node name to the file specification to specify the file server to which the include statement applies. If you do not specify a NAS node name, the file system identified refers to the NAS node name specified in the client system options file (`dsm.sys`) or on the command line.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

For the ***include.image*** option, the pattern is the name of a mounted file system or raw logical volume.

mgmtclassname
Specifies the name of the management class to assign to the objects. If a management class is not specified, the default management class is used.

Examples

Options file:

```
include /home/proj/text/devel.*
include /home/proj/text/* textfiles
include * managall
include.image /home/*/*
include.archive /home/proj/text/* myarchiveclass
```

```
include.backup /home/proj/text/* mybackupclass
include.compression /home/proj/text/devel.*
include.encrypt /home/proj/gordon/*
include.fs.nas netappsj/vol/vol0 homemgmtclass
include.image /home ALLIMAGES type=snapshot snapshotcachesize=40
```

Command line:

Does not apply.

Lanfreecommmethod

Authorized User

The ***lanfreecommmethod*** option specifies the communications protocol between the Tivoli Storage Manager client and Storage Agent. This enables processing between the client and the SAN-attached storage device.

Use the ***lanfreeshmport*** to specify the Shared Memory port number where the Storage Agent is listening. See "Lanfreeshmport" on page 169 for more information

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Attention: The ***lanfreecommmethod*** option is not valid if HSM is installed. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794 for more information.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

commmethod
Specifies the supported protocol for your Tivoli Storage Manager client:

TCPip
The Transmission Control Protocol/Internet Protocol (TCP/IP) communication method.

Use the ***lanfreetcpport*** to specify the TCP/IP port number where the Storage Agent is listening. See "Lanfreetcpport" on page 170 for more information. For AIX, AIX 5L, and HP-UX *root* users, the Shared Memory communication method is the default and TCP/IP is optional. AIX, AIX 5L, and HP-UX *non-root* users can only use the TCP/IP communication method. Solaris *root* and *non-root* users can only use the TCP/IP communication method.

SHAREdmem
Use the Shared Memory communication method when the client and server are running on the same system. Shared Memory provides better performance than the TCP/IP protocol. This is the default communication method for AIX, AIX 5L, and HP-UX *root* users. When specifying this communications method on AIX, the backup-archive client user must be logged in as root or have the same user ID as the process running the Storage Agent. AIX, AIX 5L, and HP-UX *non-root* users must use the default TCP/IP communication method and cannot use the Shared Memory communication method. See "Commmethod" on page 127 for logon restrictions when using this communication method.

Examples

Options file:

```
lanfreec tcp
```

Command line:

```
-lanfreec=tcp
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Lanfreeshmport

Authorized User

The ***lanfreeshmport*** option specifies the Shared Memory port number where the Tivoli Storage Manager Storage Agent is listening. This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Attention: The ***lanfreeshmport*** option is not valid if HSM is installed. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794 for more information.

Use this option when ***lanfreecommmethod***=*SHAREdmem* is specified for communication between the Tivoli Storage Manager client and Storage Agent. This enables processing between the client and the SAN-attached storage device. See "Lanfreecommmethod" on page 167 for more information about the ***lanfreecommmethod*** option.

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Options File

Place this option in the client system options file (`dsm.sys`) *within* a server stanza.

Syntax

Parameters

port_address
Specifies the Shared Memory port number where the Storage Agent is listening. The range of values is 1000 through 32767; the default is 1510.

Examples

Options file:

```
lanfrees 1520
```

Command line:

```
-lanfrees=1520
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Lanfreetcpport

Authorized User

The ***lanfreetcpport*** option specifies the TCP/IP port number where the Tivoli Storage Manager Storage Agent is listening.

Attention: The ***lanfreetcpport*** option is not valid if HSM is installed. See *Tivoli Space Manager for Unix Using the Hierarchical Storage Management Clients*, GC32-0794 for more information.

Use this option when you specify ***lanfreecommmethod***=*TCPip* for communication between the Tivoli Storage Manager client and Storage Agent. See "Lanfreecommmethod" on page 167 for more information about the ***lanfreecommmethod*** option.

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

port_address
Specifies the TCP/IP port number where the Storage Agent is listening. The range of values is 1000 through 32767; the default is 1500.

Examples

Options file:

```
lanfreetcp 1520
```

Command line:

```
-lanfreetcp=1520
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Largecommbuffers

Authorized User

The ***largecommbuffers*** option specifies whether the client uses increased buffers to transfer large amounts of data between the client and the server. You can disable this option when your workstation is running low on memory.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

No Specifies that increased buffers *are not* used to transfer large amounts of data to the server. This is the default. For AIX and AIX 5L, the default is *Yes*.

Yes
Specifies that increased buffers *are* used to transfer large amounts of data to the server. This is the default for AIX and AIX 5L *only*.

Examples

Options file:

```
largecommbuffers yes
```

Command line:

```
-largecommbuffers=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Localbackupset

The ***localbackupset*** option specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the Tivoli Storage Manager server to restore a local backup set on a standalone workstation. You can use this option on the command line or place it your client options file (`dsm.opt`).

If you set the ***localbackupset*** option to *yes*, the GUI does not attempt initial logon with the server. In this case, the GUI only enables the restore functionality.

If you set the ***localbackupset*** option to *no* (the default), the GUI attempts initial logon with the server and enables all GUI functions.

To start the GUI and bypass the initial logon with the server to restore a local backup set on a standalone workstation, enter:

```
dsm -localbackupset=yes
```

Note: The **restore backupset** command supports restore of local backup sets on a standalone workstation *without* using the ***localbackupset*** option. See "Restore Backupset" on page 318 for more information.

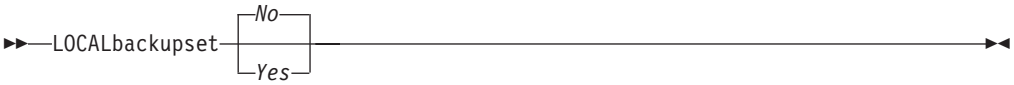
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt` or the client system options file `dsm.sys`.

Syntax



Parameters

No Specifies that the GUI attempts initial logon with the server and enables all functions. This is the default.

Yes
Specifies that the GUI does not attempt initial logon with the server and enables only the restore functionality.

Examples

Options file:

```
localbackupset yes
```

Command line:

```
dsm -localbackupset=yes
```

Mailprog

Authorized User (UNIX requires access authority.)

The ***mailprog*** option specifies the program and user ID to which you want to send a newly-generated password when the old password expires. Use this option only when you select *generate* with the ***passwordaccess*** option.

Supported Clients

This option is for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

filespec
Specifies the path and file name of the program to which you want to send a newly-generated password. The program you specify must accept standard output.

userid
Specifies the user ID of the user to whom you want to send a newly-generated password. For OS/390 UNIX System Services, enter the user ID in uppercase letters.

Examples

Options file:

```
mailprog /usr/bin/xsend root (for AIX, AIX 5L)
mailprog /bin/mailx USER1 (for OS/390 UNIX System Services)
```

Note: Run the **enroll** command before you use *xsend*.

Command line:

```
Does not apply.
```

Managedservices

Authorized User (UNIX requires access authority.)

The ***managedservices*** option specifies whether the Tivoli Storage Manager Client Acceptor daemon (CAD) manages the scheduler, the Web client, or both.

Note: The Tivoli Storage Manager Client API does not support this option.

See "Configuring the CAD to Manage the Scheduler" on page 93 for instructions to set up the CAD to manage the scheduler.

The CAD serves as an external timer for the scheduler. When the scheduler is started, it queries the server for the next scheduled event. The event is either executed immediately or the scheduler exits. The CAD restarts the scheduler when it is time to execute the scheduled event.

Notes:

1. If you set the ***schedmode*** option to *prompt*, the server prompts the CAD when it is time to run the schedule. The scheduler will connect and disconnect to the server when the CAD is first started.
2. Set the ***passwordaccess*** option to *generate* in your client system options, so that Tivoli Storage Manager generates your password automatically. See "Passwordaccess" on page 185 for more information.

Using the ***managedservices*** option can provide the following benefits:

- Memory retention problems that may occur when using traditional methods of running the scheduler are resolved. Using the CAD to manage the scheduler requires very little memory between scheduled operations.
- The CAD can manage both the scheduler program and the Web client, reducing the number of background processes on your workstation.
- By default, if you do not specify the ***managedservices*** option, the CAD manages the Web client to provide backward compatibility.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

mode
Specifies whether the CAD manages the scheduler, the Web client, or both.

webclient
Specifies that the CAD manages the Web client. This is the default.

schedule
Specifies that the CAD manages the scheduler.

Examples

Options file:

The following are examples of how you might specify the ***managedservices*** option in your options file.

Task Specify that the CAD manages the Web client *only*.

```
managedservices webclient
```

Task Specify that the CAD manages the scheduler *only*.

```
managedservices schedule
```

Task Specify that the CAD manages both the Web client and the scheduler.

```
managedservices schedule webclient
```

Note: The order in which these values are specified is not important.

Command line:

Does not apply.

Maxcmdretries

Authorized User

The ***maxcmdretries*** option specifies the maximum number of times the client scheduler (on your workstation) attempts to process a scheduled command that fails. The command retry starts *only if* the client scheduler has not yet backed up a file, never connected to the server, or failed before backing up a file. Use this option *only when* the scheduler is running.

Note: The Tivoli Storage Manager Client API does not support this option.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides what you specify in the client options file *after* your client node successfully contacts the server.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

maxcmdretries
Specifies the number of times the client scheduler can attempt to process a scheduled command that fails. The range of values is zero through 9999; the default is 2.

Examples

Options file:

```
maxcmdr 4
```

Command line:

```
-maxcmdretries=3
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Memoryefficientbackup

The ***memoryefficientbackup*** option specifies a memory conserving algorithm for processing incremental backups, that backs up one directory at a time, using less memory. Use this option with the **incremental** command when your workstation is memory constrained.

Note: The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

No Your client node uses the faster, more memory-intensive method when processing incremental backups. This is the default.

Yes
Your client node uses the method that requires less memory when processing incremental backups.

Examples

Options file:

```
memoryefficientbackup yes
```

Command line:

```
-memoryef=no
```

Nasnodename

The ***nasnodename*** option specifies the node name for the NAS file server when processing NAS file systems. The node name identifies the NAS file server to the Tivoli Storage Manager server. The server must register the NAS file server.

Note: The Tivoli Storage Manager Client API does not support this option.

You can specify this option on the command line or in the client system options file `dsm.sys`.

You can override the default value in the `dsm.sys` file by entering a different value on the command line. If you do not specify the ***nasnodename*** option in the `dsm.sys` file, you *must* specify this option on the command line when processing NAS file systems.

Supported Clients

This option is valid for the AIX, AIX 5L, and Solaris clients *only*.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

nodename
Specifies the node name for the NAS file server.

Examples

Options file:

```
nasnodename nas2
```

Command line:

```
-nasnodename=nas2
```

Nfstimeout

The ***nfstimeout*** option specifies the number of seconds the server waits for a status system call on an NFS file system before it times out.

You can use this option to mitigate the default behavior of status calls on NFS file systems. For example, if an NFS file system is stale, a status system call will be timed out by NFS (softmounted) or hang the process (hardmounted).

When the value of this option is changed to a value other than zero, a new (child) process is created to issue the status system call. The new process is timed out by the main (parent) process and the operation can continue.

Note: The server can also define this option.

Supported Clients

This option is for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` within a server stanza *or* the client options file `dsm.opt`.

Syntax

Parameters

number
Specifies the number of seconds the server waits for a status system call on an NFS file system before timing out. The default is 0 seconds.

Examples

Options file:

```
nfstimeout 10
```

Command line:

```
-nfstimeout=10
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Nodename

Authorized User

Use the ***nodename*** option in your client system options file `dsm.sys` to identify your workstation to the server. You can use different node names to identify multiple operating systems on your workstation.

When you use the ***nodename*** option, Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required.

If you want to restore or retrieve files from the server while you are working from a different workstation, use the ***virtualnodename*** option. See "Virtualnodename" on page 227 for more information.

If you are working from a different workstation, you can use the ***nodename*** option even if the ***passwordaccess*** option is set to *generate*, however, the password will be stored in the registry. To prevent this, use the ***virtualnodename*** option instead of ***nodename***.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following manner:

- In the absence of a ***nodename*** entry in the client system options file (`dsm.sys`), or a ***virtualnodename*** entry in the client user options file (`dsm.opt`), or a virtual node name specified on a command line, the default login ID is the name that the **hostname** command returns.
- If a ***nodename*** entry exists in the client system options file (`dsm.sys`), the ***nodename*** entry overrides the name that the **hostname** command returns.
- If a ***virtualnodename*** entry exists in the client user options file (`dsm.opt`), or a virtual node name is specified on a command line, it cannot be the same name as the name returned by the **hostname** command. When the server accepts the virtual node name, a password is required (if authentication is on), even if the ***passwordaccess*** option is *generate*. When a connection to the server is established, access is permitted to any file that is backed up using this login ID.

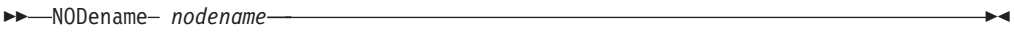
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax



Parameters

nodename
Specifies a 1 to 64 character node name for which you want to request Tivoli Storage Manager services. The default is the name of the workstation.

Examples

Options file:

```
nodename cougar
```

Command line:

```
Does not apply.
```

Numberformat

The ***numberformat*** option specifies the format you want to use to display numbers.

The AIX, AIX 5L, Solaris, and HP-UX clients support locales other than English that describe every user interface that varies with location or language. Solaris and HP-UX clients only support English, Simplified Chinese, and Japanese locale information. The default directories for system-supplied locales are as follows:

- `/usr/lib/nls/loc` for AIX and AIX 5L
- `/usr/lib/locale` for Solaris
- `/usr/lib/nls/loc/locales` for HP-UX

The backup-archive and administrative clients obtain format information from the locale definition in effect at the time the client is called. Consult the documentation on your local system for details about setting up your locale definition.

Note: This ***numberformat*** option does not affect the Web client. The Web client uses the number format for the locale that the browser is running in. If the browser is not running in a supported locale, the Web client uses the number format for American English.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

number

Displays numbers using any one of the following formats. Specify the number (1–6) that corresponds to the number format you want to use.

1 1,000.00 (This is the default)
2 1,000,00
3 1 000,00
4 1 000.00
5 1.000,00
6 1'000,00

For AIX, AIX 5L, HP-UX, SGI, and Solaris: To define number formats, modify the following lines in the source file of your locale. Whatever format you select applies both to output and to input.

decimal_point

The character that separates the whole number from its fractional part.

thousands_sep

The character that separates the hundreds from the thousands from the millions.

grouping
The number of digits in each group that is separated by the thousands_sep character.

Examples

Options file:

```
num 4
```

Command line:

```
-numberformat=4
```

This option is valid on the initial command line and in interactive mode.

Password

The ***password*** option specifies a Tivoli Storage Manager password. If you do not specify this option and your administrator has set authentication to *On*, you are prompted for a password when you start a Tivoli Storage Manager session.

Notes:

1. If the server prompts for a password, the password does not display as you enter it. *On Solaris, if you use the password option on the command line, your password will display as you enter it. On all other UNIX clients, your password does not display as you enter it on the command line.*
2. If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients will need to have a new password initialized for the new server name.

The ***password*** option is ignored when the ***passwordaccess*** option is set to *generate*.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

password
Specifies a 1 to 63 character password. A password is not case-sensitive. Valid characters include:

Characters	Description
A–Z	Any letter, A through Z, uppercase or lowercase
0–9	Any number, 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

Examples

Options file:

```
password secretword
```

Command line:

```
-password=secretword
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Passwordaccess

Authorized User

The ***passwordaccess*** option specifies whether you want to generate your password automatically or set as a user prompt. Your administrator can require a password for your client node by enabling the authentication feature. Ask your administrator if a password is required for your client node.

If a password is required, you can choose to:

- Set the password for your client node yourself and have Tivoli Storage Manager prompt for it each time you request services.
- Let Tivoli Storage Manager automatically generate a new password for your client node each time it expires, encrypt and store the password in a file, and retrieve the password from that file when you request services. You are not prompted for the password.

Use the ***passworddir*** option in your client system options file `dsm.sys` to specify the directory location in which to store the encrypted password file. The default directory location depends on how the client was installed.

When the ***passwordaccess*** option is set to *generate* and you specify the ***password*** option, the ***password*** option is ignored.

Set the ***passwordaccess*** option to *generate* in the following situations:

- When using the HSM client.
- When using the Web client.
- When performing NAS operations.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

prompt

You are prompted for your workstation password each time a client connects to the server. This is the default.

To keep your client node password secure, enter commands without the password and wait for Tivoli Storage Manager to prompt you for the password.

Each user must know the Tivoli Storage Manager password for your client node. Any user who knows the password for your client node can gain access to *all* backups and archives that originate from your client node. For example:

- If the user enters the node name and password for your client node from a different client node, the user becomes a virtual root user.
- If you change the name of your client node (using the ***nodename*** option in the `dsm.sys` file, and you specify the same node name in the `dsm.opt` file, a user who enters the correct password becomes a virtual root user. The same is true if a user specifies the same node name using the ***nodename*** option with a command and enters the correct password.

API applications must supply the password when a session is initiated. The application is responsible for obtaining the password.

generate
Encrypts and stores your password locally and generates a new password when the old password expires. An encrypted password is kept on your workstation when a session starts.

A password prompt displays when registering a workstation with a server using open registration or if your administrator changes your password manually.

You can use the ***mailprog*** option to specify the program and user ID where you want to send the new password each time the old password expires.

When logging in locally, users do not need to know the Tivoli Storage Manager password for the client node. However, by using the ***nodename*** option at a remote node, users can access files they own and files to which another user grants access. If you change the name of your client node (using the ***nodename*** option in the `dsm.sys` file, and you specify the same node name in the `dsm.opt` file, Tivoli Storage Manager prompts the users for the client node password. If a user enters the correct password, the user becomes a virtual root user. The same is true if a user specifies the same node name using the ***nodename*** option with a command.

Examples

Options file:

```
passwordaccess generate
```

Command line:

```
-passwordaccess=generate
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Passworddir

Authorized User

The ***passworddir*** option forces the directory location in which to store an encrypted password file. The default directory location depends upon how the client was installed.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options `dsm.sys` file.

Syntax

Parameters

directoryname
Specifies the path in which to store the encrypted password file. The name of the password file is TSM.PWD. If any part of the specified path does not exist, Tivoli Storage Manager attempts to create it.

The default directory for AIX and AIX 5L is `/etc/security/adsm` and for other UNIX platforms it is `/etc/adsm`.

Examples

Options file:

```
passworddir /etc/security/tsm
```

Command line:

```
Does not apply.
```

Postschedulecmd/Postnschedulecmd

Authorized User

The ***postschedulecmd*** option specifies a command that the client program processes after it runs a schedule. The client program waits for the command to complete before it continues with other processing.

If you do not want to wait, specify ***postnschedulecmd***.

Notes:

1. If the ***postschedulecmd*** command does not complete with return code 0, the client will report that the scheduled event completed with return code 8 (unless the scheduled operation encounters a more severe error yielding a higher return code). If you do not want the ***postschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***postschedulecmd*** to invoke the script or batch file. The return code for the ***postschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The Tivoli Storage Manager Client API does not support this option.
3. The server can also define the ***postschedulecmd*** option (and the ***postnschedulecmd*** option).

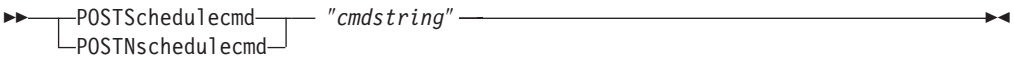
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax



Parameters

"cmdstring"
Specifies the command to process. You can enter a command to be executed after a schedule with this option. Use only one ***postschedulecmd*** option.

Use a blank, or null, string for *cmdstring* if you want to prevent any commands from running that the administrator uses for ***postschedulecmd*** or ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***postschedulecmd*** option, you cannot run a post-schedule command.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Examples

Options file:

```
postschedulecmd "restart database"
```

The command string is a valid command for restarting your database.

Command line: (Initial command line only)

```
-postschedulecmd "restart database"
```

Preschedulecmd/Prenschedulecmd

Authorized User

The ***preschedulecmd*** option specifies a command that the client program processes before it runs a schedule. The client program waits for the command to complete before it starts the schedule.

If you do not want it to wait, specify ***prenschedulecmd***.

Notes:

1. Successful completion of the ***preschedulecmd*** command is considered to be a prerequisite to running the scheduled operation. If the ***preschedulecmd*** command does not complete with return code 0, the scheduled operation and any ***postschedulecmd*** and ***postnschedulecmd*** commands will not run. The client will report that the scheduled event failed, and the return code will be 12. If you do not want the ***preschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***preschedulecmd*** to invoke the script or batch file. The return code for the ***preschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The Tivoli Storage Manager Client API does not support this option.
3. The server can also define the ***preschedulecmd*** option (and the ***prenschedulecmd*** option).

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

"cmdstring"

Specifies the command to process. Use only one ***preschedulecmd*** option. You can enter a command to be executed before a schedule using this option.

Use a blank or null string for *cmdstring* if you want to prevent any commands from running that the administrator uses for ***postschedulecmd*** and ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***preschedulecmd*** option, you cannot run a pre-schedule command.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Examples

Options file:

```
preschedulecmd "<insert your database product's quiesce command
here> database"
```

The command string is a valid command for quiescing your database.

Command line: (Initial command line only)

```
-preschedulecmd "quiesce database"
```

Queryschedperiod

Authorized User

The ***queryschedperiod*** option specifies the number of hours you want the client scheduler to wait between attempts to contact the server for scheduled work. This option applies only when you set the ***schedmode*** option to *polling*. This option is used only when the **scheduler** is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value set in your client options file after your client node successfully contacts the server.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

hours
Specifies the number of hours the client scheduler waits between attempts to contact the server for scheduled work. The range of values is 1 through 9999; the default is 12.

Examples

Options file:

```
querysch 6
```

Command line:

```
-queryschedperiod=8
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Quiet

The ***quiet*** option limits the number of messages that display on your screen during processing. For example, when you run the **incremental**, **selective**, or **archive** commands, information may appear about each file that is backed up. Use the ***quiet*** option if you do not want to display this information.

When you use the ***quiet*** option, error and processing information appears on your screen, and messages are written to log files. If you do not specify ***quiet***, the default option, ***verbose*** is used.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define the **quiet** option and override the client setting.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

There are no parameters for this option.

Examples

Options file:

```
quiet
```

Command line:

```
-quiet
```

This option is valid on the initial command line and in interactive mode.

Replace

The ***replace*** option specifies what you want the system to do when it restores files that already exist on your workstation. This option applies to the **restore**, **retrieve**, and **restore backupset** commands *only*.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

Prompt
You are prompted whether to overwrite a file that already exists on your workstation. If the existing file is read-only, you are prompted whether to overwrite it. This is the default.

All
All existing files are overwritten, including read-only files. If access to a file is denied, you are prompted to skip or overwrite the file. No action is taken on the file until there is a response to the prompt.

Yes
Any existing files are overwritten, *except* read-only files. If a file is read-only, you are prompted to overwrite the file or skip it. No action is taken on the file until there is a response to the prompt. If access to a file is denied, the file is skipped.

No Existing files are not overwritten. No prompts will display.

Examples

Options file:

```
replace all
```

Command line:

```
-replace=no
```

Resourceutilization

Authorized User

Use the ***resourceutilization*** option in your client system options file `dsm.sys` to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.

Regulating Backup and Archive Sessions

When you request a backup or archive, the client can use more than one session to the server. The default is to use a maximum of two sessions; one to query the server and one to send file data. The client can use only one server session if you specify a ***resourceutilization*** setting of 1. The client is also restricted to a single session if a user who is not authorized invokes a UNIX client with ***passwordaccess***=*generate* specified.

A client can use more than the default number of sessions when connecting to a server that is Version 3.7 or higher. For example, ***resourceutilization***=10 permits up to eight sessions with the server. Multiple sessions may be used for querying the server and sending file data.

Multiple query sessions are used when you specify multiple file specifications with a backup or archive command. For example, if you enter:

```
inc filespaceA filespaceB
```

and you specify ***resourceutilization***=5, the client may start a second session to query files on file space B. Whether or not the second session starts depends on how long it takes to query the server about files backed up on file space A. The client may also try to read data from the file system and send it to the server on multiple sessions.

Regulating Restore Sessions

When you request a restore, the default is to use a maximum of one session, based on how many tapes the requested data is stored on, how many tape drives are available, and the maximum number of mount points allowed for the node.

Notes:

1. If all of the files are on disk, only one session is used. There is no multi-session for a pure disk storage pool restore. However, if you are performing a restore in which the files reside on 4 tapes and some on disk, you could use up to 5 sessions during the restore.
2. The Tivoli Storage Manager server can set the maximum number of mount points a node can use on the server using the MAXNUMMP parameter.

For example, if the data you want to restore is on 5 different tape volumes, the maximum number of mount points is 5 for your node, and ***resourceutilization*** is set to 3, then 3 sessions will be used for the restore. If you increase the ***resourceutilization*** setting to 5, then 5 sessions will be used for the restore. There is a 1 to 1 relationship to the number of restore sessions allowed and the ***resourceutilization*** setting. Multiple restore sessions are only allowed for no query restore operations.

Considerations

The following factors can affect the throughput of multiple sessions:

- The server's ability to handle multiple client sessions. Is there sufficient memory, multiple storage volumes, and CPU cycles to increase backup throughput?
- The client's ability to drive multiple sessions (sufficient CPU, memory, etc.).

- The configuration of the client storage subsystem. File systems that are striped across multiple disks, using either software striping or RAID-5 can better handle an increase in random read requests than a single drive file system. Additionally, a single drive file system may not see performance improvement if it attempts to handle many random concurrent read requests.
- Sufficient bandwidth in the network to support the increased traffic.

Potentially undesirable aspects of running multiple sessions include:

- The client could produce multiple accounting records.
- The server may not start enough concurrent sessions. To avoid this, the server *maxsessions* parameter must be reviewed and possibly changed.
- A query node command may not summarize client activity.

Notes:

1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax

Parameters

number
Specifies the level of resources the Tivoli Storage Manager server and client can use during processing. The range of values that you can specify is 1 through 10.

Examples

Options file:

```
resourceutilization 7
```

Command line:

```
Does not apply
```

Retryperiod

Authorized User

The ***retryperiod*** option specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails, or between unsuccessful attempts to report results to the server. Use this option only when the scheduler is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value in your client options file after your client node successfully contacts the server.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

minutes
Specifies the number of minutes the client scheduler waits between attempts to contact the server, or to process a scheduled command that fails. The range of values is 1 through 9999; the default is 20.

Examples

Options file:

```
retryp 10
```

Command line:

```
-retryperiod=10
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Revokeremoteaccess

The ***revokeremoteaccess*** option restricts an administrator with client access privilege from accessing a client workstation that is running the Web client. This option does not restrict administrators with client owner, system, or policy privilege from accessing your workstation through the Web client.

Note: The Tivoli Storage Manager Client API does not support this option.

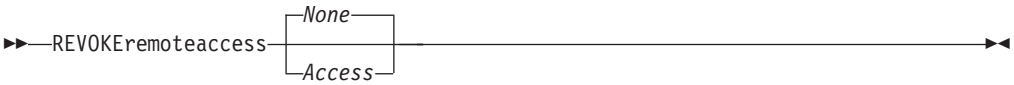
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt` *or* the client system options file `dsm.sys`.

Syntax



Parameters

None
Does not revoke access to administrators who have client access authority for the client. This is the default.

Access
Revokes access to administrators who have client access authority for the client.

Examples

Options file:

```
revokeremoteaccess none
```

Command line:

```
Does not apply
```

Schedcmddisabled

Authorized User

The ***schedcmddisabled*** option specifies whether to disable the scheduling of commands by the server ***action*=command** option on the **define schedule** server command.

This option does not disable the ***preschedulecmd*** and ***postschedulecmd*** commands. However, you can specify ***preschedulecmd*** or ***postschedulecmd*** with a blank or a null string to disable the scheduling of these commands. Commands scheduled by the server using the ***action*=command** option on the **define schedule** server command may also be disabled in the same way.

Use the **query schedule** command to query the schedules defined by your administrator. See "Query Schedule" on page 312 for more information.

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

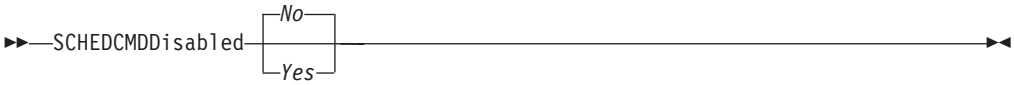
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys` *within* a server stanza.

Syntax



Parameters

Yes
Specifies that Tivoli Storage Manager disables the scheduling of commands by the server using the ***action*=command** option on the **define schedule** server command.

No Specifies that Tivoli Storage Manager does not disable the scheduling of commands by the server using the ***action*=command** option on the **define schedule** server command. This is the default.

Examples

Options file:
```
schedcmddisabled no
```

Command line:
```
Does not apply.
```

Schedlogname

Authorized User

The ***schedlogname*** option specifies the path and file name where you want to store schedule log information. Use this option only when the scheduler is running.

When you run the **schedule** command, output from scheduled commands is displayed on your screen. Output is also sent to the file you specify with this option.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

filespec
Specifies the path and file name where you want to store schedule log information when processing scheduled work.

If you specify a file name only, the file is stored in your current directory. The default is the installation directory with a file name of `dsmsched.log`. The `dsmsched.log` file *cannot* be a symbolic link.

Examples

Options file:

```
schedlogname /home/mydir/schedlog.jan
```

Command line:

```
-schedlogname=/home/mydir/schedlog.jan
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedlogretention

Authorized User

The ***schedlogretention*** option specifies the number of days to keep entries in the schedule log, and whether to save the pruned entries. The schedule log is pruned after a scheduled event completes.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

N or *days*

Specifies how long to wait before pruning the schedule log.

N Do not prune the log. This permits the log to grow indefinitely. This is the default.

days

Specifies the number of days to keep log file entries before pruning. The range of values is zero through 9999.

D or *S*

Specifies whether to save the pruned entries. Use a space or comma to separate this parameter from the previous one.

D Discards the log entries when pruning the log. This is the default.

S Saves the log entries when pruning the log.

Pruned entries are copied to the `dsmsched.pru` file that is stored in the same directory as the schedule log.

Examples

Options file:

```
schedlogretention 30 S
```

Command line:

```
-schedlogretention=30,S
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedmode

Authorized User

The ***schedmode*** option specifies whether you want to use the *polling* mode (your client node periodically queries the server for scheduled work), or the *prompted* mode (the server contacts your client node when it is time to start a scheduled operation). All communication methods can use the client polling mode, but only TCP/IP can use the server prompted mode.

Note: This option applies *only if* you are using the TCP/IP communication method, and the **schedule** command is running.

Your administrator can specify that the server support both modes or just one mode. If your administrator specifies that both modes are supported, you can select either schedule mode. If your administrator specifies only one mode, you must specify that mode in your client options file or scheduled work will not process.

If you specify the *prompted* mode, you must supply values for the ***tcpclientaddress*** and ***tcpclientport*** options on the **schedule** command. You can then be contacted at an address or port other than the one that made first contact with the server.

Notes:

1. Tivoli Storage Manager does not support the scheduler running in prompted mode outside a firewall.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

POlling
The client scheduler queries the server for scheduled work at prescribed time intervals. This is the default. You can set the time intervals using the ***queryschedperiod*** option.

PRompted
The client scheduler waits for the server to contact your client node when scheduled work needs to be done.

Examples

Options file:

```
schedmode prompted
```

Command line:

```
-schedmod=po
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Scrolllines

The ***scrolllines*** option specifies the number of lines of information that display on your screen at one time. Use this option when you set the ***scrollprompt*** option to *Yes* and you use commands.

Use the ***scrollprompt*** option with all query commands except the following:
- **query mgmtclass**
- **query schedule**
- **query session**
- **query inclexcl**

Notes:
1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

number
Specifies the number of lines of information that display on your screen at one time. The range of values is 1 through 80; the default is 20.

Examples

Options file:
```
scrolllines 25
```

Command line:
```
-scrolll=25
```

This option is valid on the initial command line and in interactive mode.

Scrollprompt

The ***scrollprompt*** option specifies whether you want Tivoli Storage Manager to stop and wait after displaying the number of lines of information you specified with the ***scrolllines*** option, or scroll through and stop at the end of the information list.

Use the ***scrollprompt*** option with all query commands except the following:

- **query mgmtclass**
- **query schedule**
- **query session**
- **query inclexcl**

Notes:

1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax

Parameters

No Scrolls to the end of the list and stops. This is the default.

Yes
Stops and waits after displaying the number of lines you specified with the ***scrolllines*** option. The following prompt displays at the bottom of the screen:

```
Press 'Q' to quit, 'C' to continuous scroll, or 'Enter' to
continue.
```

Examples

Options file:

```
scrollprompt yes
```

Command line:

```
-scrollp=yes
```

This option is valid on the initial command line and in interactive mode.

Servername

In your client system options file (dsm.sys), the ***servername*** option specifies the name you want to use to identify a server and to begin a stanza containing options for that server. You can name and specify options for more than one server.

The following example demonstrates how to specify options for two different servers:

```
SErvername     server_a
  COMMMethod               TCPip
  TCPPort                  1500
  TCPServeraddress         almvmd.almaden.ibm.com
  PASSWORDAccess           prompt
  GRoups                   tsm
  USERs                    sullivan  mushock  tallan
  INCLExcl                 /adm/tsm/backup.excl

SErvername     server_b
  COMMMethod               SHAREdmem
  shmport                  1520
  PASSWORDAccess           generate
  MAILprog                 /usr/bin/xsend root
  GRoups                   system tsm
  INCLExcl                 /adm/tsm/archive.excl
```

In your client user options file (dsm.opt), the ***servername*** option specifies which server, of those named in your client system options file (dsm.sys), to contact for backup-archive services. When specified in a client options file or on the command line, the ***servername*** option overrides the default server specified in your client system options file.

Notes:

1. You cannot use the ***servername*** option to override the server that is specified for migration in your client system options file.
2. If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients will need to have a new password initialized for the new server name.

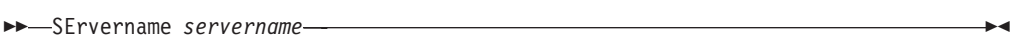
Supported Clients

This option is for all UNIX clients.

Options File

Place this option in both the client options file dsm.opt and the client system options file dsm.sys.

Syntax



Parameters

servername

In your client system options file dsm.sys, specify the name you want to assign to a particular server. In your client user options file dsm.opt or on the

command line, specify the name of the server you want to contact for backup-archive services. A server name is not case sensitive; it can have up to 64 characters.

Examples

Options file:

```
servername server_a
```

Command line:

```
-se=server_b
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Shmport

Authorized User (UNIX requires access authority.)

The ***shmport*** option specifies the TCP/IP port address that the server is listening on to establish a shared memory connection. To use shared memory, TCP/IP must be installed on your workstation.

Note: The value specified for the ***shmport*** option in the client system options file must match the value specified for ***shmport*** in the server options file.

Supported Clients

This option is valid for AIX, AIX 5L, HP-UX, and Solaris clients *only*.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

port_address
Specifies the TCP/IP address that the server is listening on to establish a shared memory connection. The range of values is 1000 through 32767; the default is 1510.

Examples

Options file:

```
shmport 1520
```

Command line:

```
Does not apply.
```

Snapshotcachesize

Authorized User

Use the ***snapshotcachesize*** option with the **backup image** command, the ***include.image*** option, or in your `dsm.sys` file to specify an appropriate snapshot size so that all old data blocks can be stored during an online image backup. A snapshot size of 100 percent will ensure a valid snapshot.

Supported Clients

This option is valid for Linux86 client *only*. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file (`dsm.sys`).

Syntax

Parameters

snapshotcachesize
Specifies an appropriate snapshot size so that all old data blocks can be stored during an online image backup. The value is a percent of the total size of the volume being backed up. The range of values is one through 100 percent; the default is 100 percent.

Examples

Options file:

```
snapshotcachesize 40
```

Command line:

Does not apply.

Subdir

The ***subdir*** option specifies whether you want to include subdirectories of named directories for processing on the following commands:

archive
delete archive
incremental
query archive
query backup
query backupset
restore
restore backupset
retrieve
selective

For example, if you specify ***subdir***=*yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

Notes:

1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

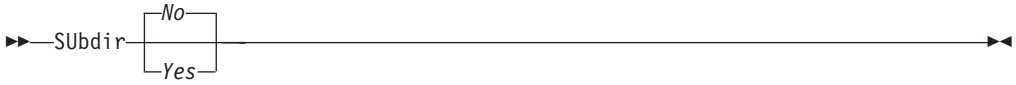
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax



Parameters

No Subdirectories are not processed. This is the default.

Yes
Subdirectories are processed. Because the client program searches all subdirectories of a directory that is being processed, processing can take longer to complete. Specify *Yes* only when necessary.

Note: If you use the *preservepath* option in addition to ***subdir***=*yes*, it can affect which subdirectories are processed. For more information, see "Preservepath" on page 262.

If a subdirectory is a mounted file system, it will not process even if you specify ***subdir***=*yes*.

Examples

Options file:

```
subdir no
```

Command line:

To restore the structure:

```
/path2/dir1
/path2/dir1/file1
/path2/dir1/dir2
/path2/dir1/dir2/file1
```

enter any of the following commands:

```
dsmc rest "/path/dir1/*" /path2/ -su=yes
dsmc rest "/path/dir1/file*" /path2/ -su=yes
dsmc rest "/path/dir1/file1*" /path2/ -su=yes
```

Tapeprompt

The ***tapeprompt*** option specifies whether you want to wait for a tape to mount if it is required for a backup, archive, restore, or retrieve process, or to be prompted for a choice.

Tape prompting does not occur during a scheduled operation regardless of the setting for the ***tapeprompt*** option.

The ***tapeprompt*** option can be used with the following commands:

archive
incremental
restore
retrieve
selective

Note: The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax

Parameters

No You are not prompted for your choice. The server waits for the appropriate tape to mount. This is the default.

Yes
You are prompted when a tape is required to back up, archive, restore, or retrieve data. At the prompt, you can wait for the appropriate tape to be mounted, always wait for a tape to be mounted, skip a particular object, skip all objects on a single tape, skip all objects on all tapes, or cancel the entire operation.

Examples

Options file:

```
tapeprompt yes
```

Command line:

```
-tapep=yes
```

This option is valid on the initial command line and in interactive mode.

Tcpbuffsize

Authorized User

The ***tcpbuffsize*** option specifies the size of the internal TCP/IP communication buffer. Although it uses more memory, a larger buffer can improve communication performance.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

size

Specifies the size, in kilobytes, that you want to use for the internal TCP/IP communication buffer. The range of values is 1 through 512; the default is 31.

Depending on the operating system communication settings, your system might not accept all values in the range of 1 through 512.

Examples

Options file:

```
tcpb 2
```

Command line:

```
-tcpbuffsize=31
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpclientaddress

Authorized User

The ***tcpclientaddress*** option specifies a TCP/IP address if your client node has more than one address, and you want the server to contact an address other than the one that was used to make the first server contact.

Use this option only if you use the *prompted* parameter with the ***schedmode*** option or when the **schedule** command is running.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

client_address
Specifies the TCP/IP address you want the server to use to contact your client node. Specify a TCP/IP Internet domain name or a dot address.

Examples

Options file:

```
tcpclienta dsmclnt.sanjose.ibm.com
```

Command line:

```
-tcpclientaddress=128.33.10.249
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpclientport

Authorized User

The ***tcpclientport*** option specifies a different TCP/IP port number for the server to contact than the one that was used to make the first server contact. If the default port or the specified port is busy, the server attempts to use any available port. Use this option only if you specify the *prompted* parameter with the ***schedmode*** option or when the **schedule** command is running.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

client_port_address
Specifies the TCP/IP port address you want the server to use to contact your client node. The range of values is 1000 through 32767; the default is 1501.

Examples

Options file:

```
tcpclientp 1502
```

Command line:

```
-tcpclientport=1492
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpnodelay

Authorized User

Note: This option is for AIX and AIX 5L clients *only*. All other UNIX clients buffer small transactions before sending them to the server.

The ***tcpnodelay*** specifies whether to send small transactions to the server, without buffering them first. A *small transaction* is smaller than the byte limit set with the ***txnbytelimit*** option. Specifying ***tcpnodelay*** *yes* might improve performance in higher-speed networks.

Supported Clients

This option is valid for AIX and AIX 5L clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

No Do not send small transactions without buffering them first. This is the default.

Yes
Send small transactions without buffering them first. When you specify ***tcpnodelay*** *yes*, data packets less than the maximum transmission unit (MTU) size are sent immediately. Specifying ***tcpnodelay*** *yes* might improve performance in higher-speed networks.

Examples

Options file:

```
tcpnodelay yes
```

Command line:

```
Does not apply.
```

Tcpport

Authorized User

The ***tcpport*** option specifies a TCP/IP port address for a server. You can obtain this address from your administrator.

Tivoli Storage Manager Firewall Support

To enable the backup-archive client, Command Line Admin client, and the Scheduler (running in polling mode) to run outside a firewall, the port specified by the option ***tcpport*** (default 1500) must be opened in the firewall.

Note: Tivoli Storage Manager does not support the scheduler running in *prompted* mode outside a firewall.

The ***webports*** option enables the use of the Web client outside a firewall by specifying the TCP/IP port number used by the Tivoli Storage Manager Client Acceptor daemon and the Web Client Agent service for communications with the Web GUI.

The ports specified with the ***webports*** option and the client option ***httpport*** must be opened in the firewall. See "Httpport" on page 159 and "Webports" on page 229 for more information.

See "Tivoli Storage Manager Firewall Support" on page 47 for further considerations regarding Tivoli Storage Manager firewall support.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

port_address
Specifies the TCP/IP port address that is used to communicate with a server. The range of values is 1000 through 32767; the default is 1500.

Examples

Options file:

```
tcpp 1501
```

Command line:

```
-tcpport=1501
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpserveraddress

Authorized User

The ***tcpserveraddress*** option specifies the TCP/IP address for a server. You can obtain this server address from your administrator.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

server_address
Specifies a 1 to 64 character TCP/IP address for a server. Specify a TCP/IP domain name or a dot address.

Examples

Options file:

```
tcps dsmchost.endicott.ibm.com
```

Command line:

```
-tcpserveraddress=129.33.24.99
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpwindowsize

Authorized User

The ***tcpwindowsize*** option specifies the amount of data in kilobytes that is buffered when receiving data on a TCP/IP connection. To improve backup or archive performance, increase the tcpwindowsize on the server. To improve restore or retrieve performance, increase the tcpwindowsize on the client.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

window_size
Specifies the size, in kilobytes, to use for your client node TCP/IP sliding window.

The range of values is 1 through 2048. For Solaris the maximum value is 1024. The default is 32.

Note: Depending on the operating system communication settings, your system might not accept all values in the range of values.

Examples

Options file:

```
tcpwindowsize 1
```

Command line:

```
-tcpw=24
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Timeformat

The ***timeformat*** option specifies the format in which you want to display system time.

The AIX, AIX 5L, Solaris, and HP-UX clients support locales other than English that describe every user interface that varies with location or language. Solaris and HP-UX clients only support English, Simplified Chinese, and Japanese locale information. The default directories for system-supplied locales are as follows:

- `/usr/lib/nls/loc` for AIX and AIX 5L
- `/usr/lib/locale` for Solaris
- `/usr/lib/nls/loc/locales` for HP-UX

The backup-archive and administrative clients obtain format information from the locale definition in effect at the time the client is called. Consult the documentation on your local system for details about setting up your locale definition.

Note: This ***timeformat*** option does not affect the Web client. The Web client uses the time format for the locale that the browser is running in. If the browser is not running in a locale that Tivoli Storage Manager supports, the Web client uses the time format for American English.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax

Parameters

format_number

Displays time in one of the formats listed below. Select the format number that corresponds to the format you want to use.

0 Use the locale-defined time format.

For AIX, AIX 5L, HP-UX, SGI, and Solaris: This is the default if the locale-specified format consists of digits, separator characters, and, if applicable, the AM or PM string.

1 23:00:00 (This is the default)

For AIX, AIX 5L, HP-UX, SGI, and Solaris: This is the default if the locale-specified format does not consist of digits, separator characters, and, if applicable, the AM or PM string.

2 23,00,00

3 23.00.00

4 12:00:00 A/P

For AIX, AIX 5L, HP-UX, SGI, and Solaris: To set a particular time format, edit the source file for your locale and modify the t_fmt line to support your needs. Whatever time format you select applies both to output and to input.

"**%H:%M:%S**"
: Displays time in the form **hh:mm:ss** with **hh** ranging from 0 through 23.

"**%H,%M,%S**"
: Displays time in the form **hh,mm,ss** with **hh** ranging from 0 through 23.

"**%I,%M,0p**"
: Displays time in the form **hh,mm,ssA/P** with **hh** ranging from 1 through 12 and **A/P** is the local abbreviation for ante-meridian (AM in English) or post-meridian (PM in English).

Examples

Options file:

```
timeformat 4
```

Command line:

```
-time=3
```

Txnbytelimit

Authorized User

The ***txnbytelimit*** option specifies the number of kilobytes the client program buffers before it sends a transaction to the server.

Note: The server can also define and adjust this option during self-tuning operations.

A *transaction* is the unit of work exchanged between the client and server. Because the client program can transfer more than one file or directory between the client and server before it commits the data to server storage, a transaction can contain more than one file or directory. This is called a *transaction group*.

This option permits you to control the amount of data sent between the client and server before the server commits the data and changes to the server database, thus changing the speed with which the client performs work. The amount of data sent applies when files are batched together during backup or when receiving files from the server during a restore procedure.

The server administrator can limit the number of files or directories contained within a transaction group using the ***txngroupmax*** option; the actual size of a transaction can be less than your limit. Once this number is reached, the client sends the files to the server *even if* the transaction byte limit is not reached.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

number

Specifies the number of kilobytes the client program can buffer together in a transaction before it sends data to the server. The range of values is 300 through 2097152 (2 GB); the default is 2048.

Examples

Options file:

```
txnb 2048
```

Command line:

```
-txnb=2048
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Users

Authorized User

The ***users*** option authorizes specific users on your workstation to request services from a server. You can use this option more than once to specify a large number of user IDs. If you do not specify group names with the ***groups*** option, or user IDs with the ***users*** option, all users can request Tivoli Storage Manager services. If you use the groups option, the users option, or both, only users included in one of the specified groups, or included in the list of users, can request Tivoli Storage Manager services.

Define your root user name only with the ***users*** option to exclude all other users from accessing the server.

Supported Clients

This option is valid for all UNIX clients. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

username
Names a user that you want to authorize to request Tivoli Storage Manager services.

Examples

Options file:

```
users  carol  larry  davecd  kathyba  michelle
users  amyb  tkaspar  kbsmith  egray  srjames
```

Command line:

Does not apply.

Verbose

The ***verbose*** option specifies that you want processing information to display on your screen. This is the default. When you run the **incremental**, **selective**, or **archive** commands, information displays about each file that is backed up. Use the ***quiet*** option if you do not want to display this information.

The following behavior applies when using the ***verbose*** and ***quiet*** options

- If the server specifies either the ***quiet*** or ***verbose*** option in the server client option set, the server settings override the client values, even if **force** is set to *No* on the server.
- If you specify ***quiet*** in your `dsm.opt` file, and you specify *-verbose* on the command line, *-verbose* prevails.
- If you specify both *-quiet* and *-verbose* on the same command, the last option encountered during options processing prevails. If you specify *-quiet -verbose*, *-verbose* prevails. If you specify *-verbose -quiet*, *-quiet* prevails.

Notes:

1. The Tivoli Storage Manager Client API does not support this option.
2. The server can also define this option.

Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client user options file `dsm.opt`.

Syntax

Parameters

There are no parameters for this option.

Examples

Options file:

```
verbose
```

Command line:

```
-verbose
```

This option is valid on the initial command line and in interactive mode.

Virtualmountpoint

Authorized User

The ***virtualmountpoint*** option defines a virtual mount point for a file system if you want to consider files for backup that begin with a specific directory within that file system. Using the ***virtualmountpoint*** option to identify a directory within a file system provides a direct path to the files you want to back up, saving processing time. It is more efficient to define a virtual mount point within a file system than it is to define that file system using the ***domain*** option, and then to use the ***exclude*** option in your include-exclude options list to exclude the files that you do not want to back up.

Use the ***virtualmountpoint*** option to define virtual mount points for multiple file systems, for local and remote file systems, and to define more than one virtual mount point within the same file system. Virtual mount points cannot be used in a file system handled by automounter. Use the AFS/DFS backup clients to process virtual mount points for AFS/DFS file systems.

Note: If the directory that you want to specify as a virtual mount point is a symbolic link, set the ***followsymbolic*** option to *Yes*. If that option is set to *No* (the default), you are not permitted to use a symbolic link as a virtual mount point.

After you define a virtual mount point, you can specify the path and directory name with the ***domain*** option in either the default client options file or on the **incremental** command to include it for incremental backup services. Users can also specify the path and directory name of the virtual mount point with the ***domain*** option in their own client options files and on the **incremental** command.

Supported Clients

This option is valid for all UNIX clients. The Tivoli Storage Manager Client API does not support this option.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax

Parameters

directory

Specifies the path and directory name for the directory you want to use as the virtual mount point for a file system. You cannot use wildcard characters in either the path or directory names.

Define only one virtual mount point with each ***virtualmountpoint*** option that you include in your client system options file. Use the ***virtualmountpoint*** option as many times as necessary to define all of the virtual mount points that you want to use.

Examples

Options file:

```
virtualmountpoint /afs/xyzcorp.com/home/ellen/
virtualmountpoint /afs/xyzcorp.com/home/ellen/test/data/
```

Command line:

```
-virtualmountpoint=/afs/xyzcorp.com/home/ellen/
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Virtualnodename

The ***virtualnodename*** option specifies the node name of your workstation when you want to restore or retrieve files to a different workstation.

When you use the ***virtualnodename*** option in your client options file, or with a command:

- You must specify the name you specified with the ***nodename*** option in your client systemoptions file (`dsm.sys`). This name should be different from the name returned by the **hostname** command on your workstation.
- Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required. If you enter the correct password, you have access to all backups and archives that originated from the specified node.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following ways:

- If the ***nodename*** and ***virtualnodename*** options are not specified, or a virtual node name is not specified on the command line, the default login ID is the name returned by the **hostname** command.
- If the ***nodename*** option is specified, the name specified with the ***nodename*** option overrides the name returned by the **hostname** command.
- If the ***virtualnodename*** option is specified, or a virtual node name is specified on a command line, it cannot be the same name as the name returned by the **hostname** command.

When the virtual node name is accepted by the server, a password is required (assuming authentication is on), even if the ***passwordaccess*** option is *generate*. Once a connection to the server is established, then access is permitted to any file backed up using this login ID.

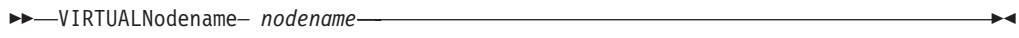
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client options file `dsm.opt`.

Syntax



Parameters

nodename
Specifies a 1- to 64-character name that identifies the node for which you want to request Tivoli Storage Manager services. There is no default.

Examples

Options file:

```
virtualnodename cougar
```

Command line:

```
-virtualn=banshee
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Webports

The ***webports*** option enables the use of the Web client outside a firewall by specifying the TCP/IP port number used by the Tivoli Storage Manager Client Acceptor daemon and Web Client Agent service for communications with the Web GUI.

Values for both the Client Acceptor daemon and the Web Client Agent service are required.

If you do not specify this option, the default value, zero (0), is used for both ports. This causes TCP/IP to randomly assign a free port number for the Client Acceptor daemon and the Web Client Agent service.

The ports you specify with the ***webports*** and ***httpport*** options must be opened in the firewall.

To enable the backup-archive client, Command Line Admin client, and the Scheduler (running in polling mode) to run outside a firewall, the port specified by the server option ***tcpport*** (default 1500) must be opened in the firewall.

Note: Tivoli Storage Manager does not support the scheduler running in *prompted* mode outside a firewall.

To enable the administrative Web interface to run outside a firewall the port specified by server option ***httpport*** (default is 1580) must be opened in the firewall.

See "Httpport" on page 159 and "Tcpport" on page 217 for more information.

Notes:

1. See "Tivoli Storage Manager Firewall Support" on page 47 for further considerations regarding Tivoli Storage Manager firewall support.
2. The Tivoli Storage Manager Client API does not support this option.

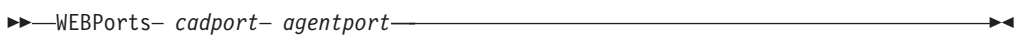
Supported Clients

This option is valid for all UNIX clients.

Options File

Place this option in the client system options file `dsm.sys`.

Syntax



Parameters

cadport
Specifies the *required* Tivoli Storage Manager Client Acceptor daemon port number. If a value is not specified, the default, zero (0), causes TCP/IP to randomly assign a free port number.

agentport
Specifies the *required* Tivoli Storage Manager Web client agent service port number. If a value is not specified, the default, zero (0), causes TCP/IP to randomly assign a free port number.

Examples

Options file:

```
webports 2123 2124
```

Command line:

```
Does not apply
```

Chapter 10. Using Options with Commands

The client program includes a group of *client command options* that you can enter with specific commands *only* from the command line. You can also enter common options to override many of the options set in your client options file `dsm.opt`. Options are processed following this precedence (order):

1. Options defined on the server with server-enforced client options. The client *cannot* override the value.
2. Options entered locally on the command line.
3. Options defined on the server for a schedule using the options parameters.
4. Options entered locally in the options file.
5. Options received from the server with client options not enforced by the server. The client *can* override the value.
6. Default option values.

For a complete list of client command options, their descriptions, the commands with which you can use them, and the location in this book for more information, see Table 31 on page 231. For a complete list of common options, see Chapter 9, "Setting Processing Options" on page 107.

Entering Options with a Command

Follow these general rules when you enter options with a command:

- Enter a command, a dash (–), the option name, an equal sign (=), and the option value or parameter. There should be no spaces on either side of the = sign. For example,

  ```
  dsmc archive -description="year end 1999" /home/
  ```

- For options that do not include parameters, enter a command, a dash (–) and the option name. For example,

  ```
  dsmc incremental -quiet
  ```

- Enter either the option name, or an abbreviation for the option name. For example, to enter the ***latest*** option, enter either `-lat` or `-latest`. The capital letters in the syntax of each option indicate the minimum abbreviation for that option name. To understand how to read the syntax diagrams, see "Reading Syntax Diagrams" on page xii.
- Enter options in any order before or after command parameters. For example, you can enter the ***subdir*** option before or after a file specification:

  ```
  dsmc selective -subdir=yes /devel/proj1/
  dsmc selective /devel/proj1/ -subdir=yes
  ```

- Separate options with a blank space when you enter more than one option in a command.
- The maximum number of characters for a file name is 256. The maximum combined length of the file name and path name is 1024 characters.

Table 31. Client Command Options

Command Option	Description	Commands	Page
archmc	Overrides the default management class for a file or a group of files.	**archive**	236

© Copyright IBM Corp. 1993, 2002

Table 31. Client Command Options (continued)

Command Option	Description	Commands	Page
class	Specifies whether to display a list of NAS objects or client objects when using the following commands:	**query backup** **delete filespace** **query filespace**	237
deletefiles	Deletes the local copy of files from your workstation after they are archived on the server. Can also be used with the **restore image** command and the ***incremental*** option to delete files from the restored image that are deleted from the file space after the image is created.	**archive** **restore image**	238
description	Specifies a description for a file that you are archiving, deleting, or retrieving. Also specifies the description of a backupset that you want to query.	**archive** **delete archive** **query archive** **query backupset** **retrieve**	239
detail	Displays management class attributes for available management classes.	**delete filespace** **query mgmtclass** **query filespace**	240
dirsonly	Backs up, restores, archives, retrieves, or displays directories *only*.	**archive** **incremental** **query archive** **query backup** **restore** **retrieve** **selective**	241
filelist	Specifies a list of files to be processed for the command. Tivoli Storage Manager opens the designated filelist and processes the files listed within according to the command.	**archive** **delete archive** **expire** **incremental** **query backup** **query archive** **restore** **retrieve** **selective**	242
filesonly	Backs up, restores, retrieves, or displays files *only*.	**incremental** **query archive** **query backup** **restore** **retrieve** **selective**	244
fromdate	Sets a date limit for files. Tivoli Storage Manager does not include files processed before this date, although older directories might be included.	**query archive** **query backup** **restore** **retrieve** **restore image** **query image**	245

Table 31. Client Command Options (continued)

Command Option	Description	Commands	Page
fromnode	Displays file spaces for an alternate node. Also specifies an alternate node from which to restore or retrieve files.	**query archive** **query backup** **query filespace** **query mgmtclass** **restore** **retrieve** **query image** **restore image**	246
fromowner	Displays file spaces for an alternate owner. Also specifies an alternate owner from which to restore or retrieve files.	**query archive** **query backup** **query image** **restore** **restore image** **retrieve**	247
fromtime	Specifies a beginning time on the specified date. Use with the *fromdate* option. This option is ignored if the *fromdate* option is absent.	**query archive** **query backup** **restore** **retrieve** **restore image**	248
ifnewer	Replaces existing files with the latest backup version only if the backup version is newer than the existing version.	**restore** **restore backupset** **retrieve**	249
inactive	Displays a list of active and inactive files when used with the *pick* option.	**query backup** **restore** **restore nas** **query image** **restore image**	250
incrbydate	Requests an incremental backup by date.	**incremental**	251
incremental	Applies changes to the base image using information from incremental backups made after the original image backup.	**restore image**	252
latest	Restores the most recent backup version of a file whether it is active or inactive.	**restore**	253
location	Specifies whether Tivoli Storage Manager searches for a backup set on the server, in local files, or on a tape device during a query or restore operation.	**query backupset** **restore backupset**	254
mode	Specifies whether to perform an image backup on an entire file system or only those files that change after the original image backup.	**backup nas** **backup image**	255
monitor	Specifies whether you want to monitor an image backup or restore of one or more file systems belonging to a NAS file server.	**backup nas** **restore nas**	256
noprompt	Suppresses the confirmation prompt when deleting an archived file.	**delete archive** **restore image**	257

Table 31. Client Command Options (continued)

Command Option	Description	Commands	Page
optfile	Specifies the options file you want to use when you start a session.	**dsmc.exe**	258
pick	Displays a list of files from which you can select files to delete, restore, or retrieve.	**delete archive** **expire** **restore** **retrieve** **restore image** **restore nas**	259
pitdate	Specifies the file backup date to use when you select files to restore. Use with the ***pittime*** option.	**query backup** **restore** **restore nas** **query image** **restore image**	260
pittime	Specifies a point-in-time on the specified date. Use with the ***pitdate*** option. This option is ignored if the ***pitdate*** option is absent.	**query backup** **restore** **restore nas** **query image** **restore image**	261
preservepath	Specifies how the restore directory path is built.	**restore** **restore backupset** **retrieve**	262
todate	Sets a date limit for files. Tivoli Storage Manager does not include files that are processed after this date. Use with the ***totime*** option.	**query archive** **query backup** **restore** **retrieve**	265
totime	Specifies an ending time on the specified date. Use with the ***todate*** option. This option is ignored if the ***todate*** option is absent.	**query archive** **query backup** **restore** **retrieve**	266
type	Displays node types that you specify.	**query node**	267
v2archive	Use this option with the **archive** command to archive only files and not directories to the server.	**archive**	268
volinformation	Backs up or restores volume restrictions, such as volume or disk space restrictions, and trustee directory assignments for the root directory of a volume.	**archive** **incremental** **selective**	269

Command Line Options Reference

The following sections contain detailed information about each of the Tivoli Storage Manager command line options. These options are arranged in alphabetical order. Information for each option includes:

- A description of the option.
- A syntax diagram of the option. The option name is shown in a combination of uppercase and lowercase characters. The uppercase characters indicate the minimum abbreviation you can use for the option name. See "Reading Syntax Diagrams" on page xii for an explanation of these diagrams.

- Detailed descriptions of the option parameters. If the parameter is a constant (a value that does not change), the minimum abbreviation is shown in uppercase letters.
- Examples of using the option on the command line.

Archmc

The ***archmc*** option specifies the available management class for your policy domain to which you want to bind your archived files.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients

Syntax

Parameters

managementclass
Specifies an available management class in the active policy set of your policy domain. This management class overrides the default management class for the files you are archiving.

Examples

Command line:

```
dsmc archive –archmc=RET2YRS /home/
plan/proj1/budget.jan
```

Class

The ***class*** option specifies whether to display a list of NAS objects or client objects when using the following commands:

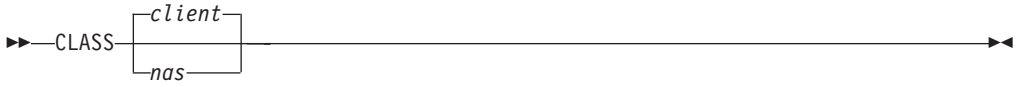
- **query backup**
- **delete filespace**
- **query filespace**

For example, to display a list of the file spaces belonging to a NAS node, specify the ***class***=*nas* option with the **query filespace** command.

Supported Clients

This option is valid for the AIX, AIX 5L, and Solaris clients *only* clients. The Tivoli Storage Manager Client API does not support this option.

Syntax



Parameters

nas
Specifies that you want to display a list of file spaces for a NAS node.

client
Specifies that you want to display a list of file spaces for a client node. This is the default.

Examples

Command line:

```
q backup -class=nas
```

Deletefiles

Use the ***deletefiles*** option with the **archive** command to delete files from your workstation after you archive them.

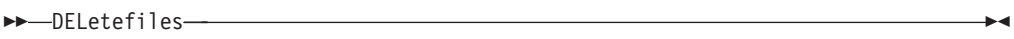
You can also use this option with the **restore image** command and the ***incremental*** option to delete files from the restored image if they were deleted after the image was created.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax



Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc archive "/home/foo/*.c" –deletefiles
dsmc restore image /local/data -incremental -deletefiles
```

Description

The ***description*** option assigns or specifies a description for files when performing archive, delete, retrieve, or query archive operations. For example, if you want to archive a file named budget.jan and assign to it the description **2002 Budget for Proj 1**, you would enter:

```
dsmc archive –des="2002 Budget for Proj 1" /home/plan/
proj1/budget.jan
```

You can also use this option to specify the description of a backup set that you want to query.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

description

Assigns a description to the file you are archiving. If you do not specify a description, the default is **archive date:***x*, where *x* is the current system date.

If you use the **archive** command to archive more than one file, the description you enter applies to each file. For example, to archive a group of files and assign the same description, *Project X*, to each file, you would enter:

```
dsmc archive –description="Project X" "/home/
allproj/.*"
```

You can then use the description to retrieve all of the files.

Examples

Command line:

```
dsmc archive "/home/foo/*.prj" –des="2002 Budget for Proj 1"
```

Detail

The ***detail*** option displays detailed information about each management class in your active policy set. If you do not use the ***detail*** option, only the management class name and a brief description displays. If you specify the ***detail*** option, information about attributes in each copy group contained in each management class will display. A management class can contain a backup copy group, an archive copy group, both, or neither.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc query mgmtclass -detail
dsmc query filespace -detail
```

Dirsonly

The ***dirsonly*** option processes directories *only*. The client does not process files.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc query backup -dirsonly "*"
```

Filelist

Use the ***filelist*** option to process a list of files. The Tivoli Storage Manager client opens the file you specify with this option and processes the list of files within according to the specific command. With the exception of the **restore** and **retrieve** commands, when you use the ***filelist*** option, Tivoli Storage Manager ignores all other file specifications on the command line.

Note: The Tivoli Storage Manager Client API does not support this option.

The files (entries) listed in the filelist must adhere to the following rules:
- Each entry must be a fully or partially qualified path to a file or directory or a relative path.
- Each entry must be on a new line.
- Do *not* use wildcard characters.
- Each entry results in the processing of only one object (file or directory).
- If the file name contains any spaces, enclose the file name with quotes.
- Tivoli Storage Manager ignores any entry that is not valid.

The following is an example of a list of files within a filelist:

```
/home/dir/file1
/usr/tivoli/file2
/usr/avi/dir1
/fs1/dir2/file3
"/fs2/Ha Ha Ha/file.txt"
"/fs3/file.txt"
```

If an entry in the filelist indicates a directory, only that directory will process and not the files within the directory.

If the file name (the `filelistspec`) you specify with the ***filelist*** option does not exist, the command fails. Tivoli Storage Manager skips any entries in the filelist that are not valid files or directories. Tivoli Storage Manager logs errors and processing continues to the next entry.

Use file specifications with the **restore** and **retrieve** commands to denote the destination for the restored filelist entries. For example, in the **restore** command:

```
restore -filelist=/home/dir/file3 /usr/record
```

```
dsmc restore -filelist=sys:u/projecta/files vol1:u/dir1/record/ -preservepath=complete
```

the file specification `/usr/record` represents the restore destination for all entries in the filelist. However, in the **selective** command:

```
selective -filelist=/home/dir/file3 /usr/record
```

the file specification `/usr/record` is ignored.

If you specify a directory in a filelist for the **delete archive** command, the directory is not deleted. Filelists that you use with the **delete archive** command should not include directories.

The entries in the list will be processed in the order they appear in the filelist. For optimal processing performance, pre-sort the filelist by file space name and path.

Note: Tivoli Storage Manager may back up a directory twice if the following conditions exist:
- The filelist contains an entry for the directory

- The filelist contains one or more entries for files within that directory
- No backup of the directory exists

For example, your filelist includes the entries `/home/dir/file1` and `/home/dir`. If the `/dir` directory does not exist on the server, the `/home/dir` directory is sent to the server a second time.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

filelistspec
Specifies the location and name of the file that contains the list of files to process with the command.

Note: When you specify the ***filelist*** option on the command line, you cannot use the ***subdir*** option.

Examples

Command line:

```
sel -filelist=/home/avi/filelist.txt
```

Filesonly

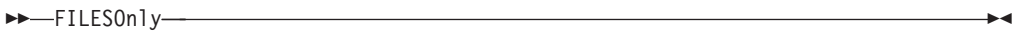
The ***filesonly*** option restricts backup and restore processing to files *only*. You cannot restore or retrieve directories from the server when using the ***filesonly*** option with the **restore** or **retrieve** commands. However, directories with default attributes are created, if required, as placeholders for files that you restore or retrieve.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax



Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc incremental -filesonly
```

Fromdate

The ***fromdate*** option specifies a date from which you want to search for backed up or archived files. Files that were backed up or archived before this date are not included, although older directories might be included, if necessary, to restore or retrieve the files.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

date

Specifies the date from which you want to search for backup copies or archived files. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc query backup -fromdate=12/11/2002 /home/dilbert/*
```

Fromnode

The ***fromnode*** option permits one node to perform commands for another node. A user on another node must use the **set access** command to permit you to query, list, restore, or retrieve files or images for that other node.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

node
Specifies the node name on a workstation or a file server whose backup copies or archived files you want to access.

Examples

Command line:

```
dsmc query archive -fromnode=bob -subdir=yes  "/home/jones/*"
```

Fromowner

The ***fromowner*** option specifies an alternate owner from which to restore files or images. The owner must give access to another to use the files or images. For example, to restore files from the `/home/devel/proja` directory belonging to *usermike* on system ***puma***, and place the restored files in a directory you own named `/home/id/proja`, you would enter:

```
dsmc restore -fromowner=usermike -fromnode=puma /home/devel/proja/
/home/id/proja/
```

Non-root users can specify ***-fromowner***=*root* to access files owned by the root user if the root user has granted them access.

Note: If you specify the ***fromowner*** option without the ***fromnode*** option, the active user must be on the same node as the ***fromowner*** user.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

owner
Name of an alternate owner.

Examples

Command line:

```
dsmc query archive "/home/id/proja/*" -fromowner=mark
```

Fromtime

Use the ***fromtime*** option with the ***fromdate*** option to specify a beginning time from which you want to search for backed up or archived files. Tivoli Storage Manager ignores this option if you do not specify the ***fromdate*** option.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

time

Specifies a beginning time on a specific date from which you want to search for backed up or archived files. If you do not specify a time, the time defaults to 23:59:59. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc q b -timeformat=4 -fromt=11:59AM -fromd=06/30/99 -tot=11:59PM
-tod=06/30/99 /home/*
```

Ifnewer

The ***ifnewer*** option replaces an existing file with the backup if the backup is newer than the existing file. Only active backups are considered unless you also use the ***inactive*** or ***latest*** options.

Note: This option is ignored if the ***replace*** option is set to *No*.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/home/grover/*" -sub=y -rep=y -ifnewer
```

Inactive

Use the ***inactive*** option with the following commands and the ***pick*** option to display both active and inactive objects:

- **restore**
- **restore nas**
- **query backup**
- **restore image**
- **query image**

You can also use the ***pick*** option to display backup versions, archive copies, and images that match the file specification you enter.

Only active backups are considered unless you also use either the ***inactive*** or the ***latest*** option.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/home/zoe/*" -inactive -pick
```

Incrbydate

Note: If you have limited time during the week to perform backups, but extra time on weekends, you can maintain current server storage of your workstation files by performing an incremental backup with the ***incrbydate*** option on weekdays and a full incremental backup on weekends.

Use the ***incrbydate*** option with the **incremental** command to back up new and changed files with a modification date later than the last incremental backup stored at the server, unless the file is excluded from backup. Files added at the client after the last incremental backup, but with a modification date earlier than the last incremental, are not backed up.

An incremental-by-date updates the date and time of the last incremental at the server. If an incremental-by-date is performed on only part of a file system, the date of the last full incremental is not updated and the next incremental-by-date will back up these files again.

Both full incrementals and incrementals-by-date back up new and changed files. An incremental-by-date takes less time to process than a full incremental and requires less memory. However, unlike a full incremental, an incremental-by-date does not maintain current server storage of *all* your workstation files because:

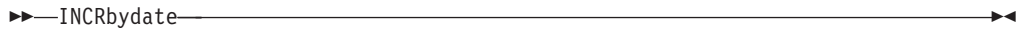
- It does not expire backup versions of files that are deleted from the workstation.
- It does not rebind backup versions to a new management class if the management class has changed.
- It does not back up files with attributes that have changed unless the modification dates and times have also changed, such as Access control list (ACL) data.
- It ignores the copy group frequency attribute of management classes.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax



Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc incremental -incrbydate
```

Incremental

Use the ***incremental*** option with the **restore image** command to ensure that any changes that were made to the base image are also applied to the restored image.

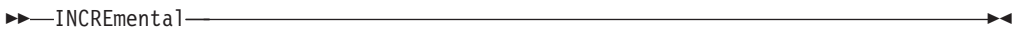
If you also use the ***deletefiles*** option, changes include the deletion of files and directories that were in the original image but later deleted from the workstation.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for AIX, AIX 5L, HP/UX, Linux86, and Solaris *only*.

Syntax



Examples

Command line:

```
res i "/home/devel/projecta/*" -incremental
```

Latest

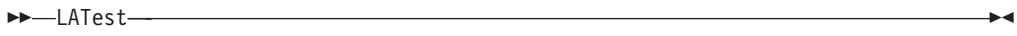
Use the ***latest*** option with the **restore** command to restore the most recent backup version of a file, even if the backup is inactive. Only active versions are considered for a restore unless you use either the ***inactive*** or the ***latest*** option.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax



Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/home/devel/projecta/*" -latest
```

Location

The ***location*** option specifies where Tivoli Storage Manager searches for the backup set for a query or restore operation. You can use this option to locate backup sets on the server or local files. Tapes that are generated on the server can be used locally by specifying the ***location*** option and either the file name or the tape device.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

server
Specifies that Tivoli Storage Manager searches for the backup set on the server. This is the default.

file Specifies that Tivoli Storage Manager searches for the backup set on a local file .

tape
Specifies that Tivoli Storage Manager searches for the backup set on a local tape device. It is no longer necessary to specify a specific tape device type name. Specifying ***location***=*tape* covers all tape device types. This parameter is valid for Solaris, AIX, AIX 5L, and HP-UX clients.

Note: For Solaris, AIX, AIX 5L, HP-UX, and Solaris: If you want to restore a backup set from a 3570 or 3590 tape device, but you do not have the 3570 or 3590 generic device driver on your client workstation, you can download these device drivers from the following Web site:

```
ftp://ftp.software.ibm.com/storage/devdrvr/
```

For Solaris: Use tapes that are fully compliant with Sun standards.

Examples

Command line:

```
restore backupset "/dev/rmt0" -loc=tape
restore backupset mybackupsetname -loc=server
restore backupset /home/budget/backupsetfile.name
-loc=file
```

Mode

The ***mode*** option specifies whether you want to perform a selective or incremental image backup (non-NAS objects), or a full or differential image backup of NAS file systems. The ***mode*** option has no effect on a raw logical device backup.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for AIX, AIX 5L, HP/UX, Linux86, and Solaris *only*.

Syntax

For non-NAS objects

For NAS File Systems

Parameters

selective
Specifies that you want to perform a full (selective) image backup. This is the default.

incremental
Specifies that you want to back up only new and changed files after the last full image backup. Deleted files are not inactivated on the server.

full
Specifies that you want to perform a NAS image backup of an entire file system.

differential
Specifies that you want to perform a NAS image backup of files that changed since the last full image backup. If an eligible full image backup does not exist, a full image backup occurs. This is the default.

Examples

Task Perform the NAS image backup of the entire file system.

Command: `dsmc backup nas -mode=full -nasnodename=nas1 /vol/vol0 /vol/vol1`

Task Back up the `/home/test` file space using an image incremental backup that backs up only new and changed files after the last full image backup.

Command: `dsmc backup image /home/test -mode=incremental`

Monitor

The ***monitor*** option specifies whether you want to monitor an image backup or restore of one or more file systems belonging to a Network Attached Storage (NAS) file server. If you specify ***monitor***=*yes*, Tivoli Storage Manager monitors the current NAS image backup or restore operation and displays processing information on your screen. This is the default.

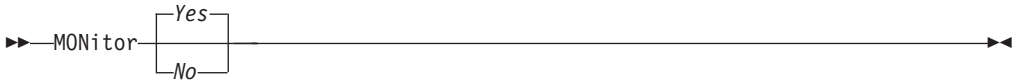
If you specify ***monitor***=*no*, Tivoli Storage Manager does not monitor the current NAS image backup or restore operation and is available to process the next command.

Use this option with the **backup nas** and **restore nas** commands.

Supported Clients

This option is valid for the AIX, AIX 5L, and Solaris clients *only* clients.

Syntax



Parameters

Yes
Specifies that you want to monitor the current NAS image backup or restore operation and display processing information on your screen. This is the default.

No Specifies that you do not want to monitor the current NAS image backup or restore operation.

Examples

Command line:

```
backup nas -mode=full -nasnodename=nas1 -monitor=yes
/vol/vol0 /vol/vol1
```

Noprompt

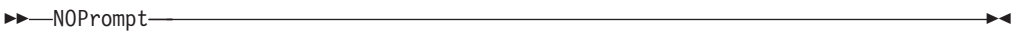
The ***noprompt*** option suppresses the confirmation prompt that normally appears before you delete an archived file, or when performing an image restore operation. Using this option can speed up the delete procedure. However, it also increases the danger of accidentally deleting an archived file that you want to save. ***Use this option with caution.***

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax



Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc delete archive -noprompt "/home/project/*"
```

Optfile

The ***optfile*** option specifies the client user options file you want to use when you start a Tivoli Storage Manager session.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

file_name
Specifies an alternate client options file, if you use the fully qualified path name. If you specify only the file name, Tivoli Storage Manager assumes you want the current directory. The default is `dsm.opt`.

Examples

Command line:

```
dsmc query session -optfile=myopts.opt
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Pick

The ***pick*** option creates a list of backup versions, images, or archive copies that match the file specification you enter. From the list, you can select the versions to process. Include the ***inactive*** option to view both active and inactive objects.

For images, if you do not specify a source file space and destination file space, the pick list contains all backed up images. In this case, the images selected from the pick list are restored to their original location. If you specify the source file space and the destination file space, you may select only one entry from the pick list.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/home/project/*" -pick -inactive
```

Pitdate

Use the ***pitdate*** option with the ***pittime*** option to establish a point in time for which you want to display or restore the latest version of your backups. Files or images that were backed up *on or before* the date and time you specified, and which were not deleted *before* the date and time you specified, are processed. Backup versions that you create after this date and time are ignored.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

date

Specifies the appropriate date. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc restore "/fs1/*" -sub=y -pitdate=08/01/2002 -pittime=06:00:00
```

Pittime

Use the ***pittime*** option with the ***pitdate*** option to establish a point in time for which you want to display or restore the latest version of your backups. Files or images that were backed up *on or before* the date and time you specify, and which were not deleted *before* the date and time you specify, are processed. Backup versions that you create after this date and time are ignored. This option is ignored if you do not specify ***pitdate*** option.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

time
Specifies a time on a specified date. If you do not specify a time, the time defaults to 23:59:59. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc q b "/fs1/*" -pitt=06:00:00 -pitd=08/01/2002
```

Preservepath

The ***preservepath*** option specifies how much of the source path to reproduce as part of the target directory path when you restore or retrieve files to a new location. Use the ***-subdir***=*yes* option to include the entire subtree of the source directory (directories and files below the lowest-level source directory) as source to be restored. If a required target directory does not exist, it is created. If a target file has the same name as a source file, it is overwritten. Use the ***-replace***=*prompt* option to have Tivoli Storage Manager prompt you before files are overwritten.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

subtree
Creates the lowest-level source directory as a subdirectory of the target directory. Files from the source directory are stored in the new subdirectory. This is the default.

complete
Restores the entire path, starting from the root, into the specified directory. The entire path includes all the directories *except* the file space name.

nobase
Restores the contents of the source directory without the lowest level, or base directory, into the specified destination directory.

none
Restores all selected source files to the target directory. No part of the source path at or above the source directory is reproduced at the target.

If you specify ***subdir***=*yes*, Tivoli Storage Manager restores all files in the source directories to the single target directory.

Examples

Command line:
For the examples below, assume that the server file space contains the following backup copies:

```
/fs/h1/m1/file.a
/fs/h1/m1/file.b
/fs/h1/m1/l1/file.x
/fs/h1/m1/l1/file.y
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -preser=complete
```

Restores these directories and files:

```
/u/ann/h1/m1/file.a
/u/ann/h1/m1/file.b
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -preser=nobase
```

Restores these directories and files:

```
/u/ann/file.a
/u/ann/file.b
```

This command:

```
dsmc res backupset /fs/h1/m1/ /u/ann/ -su=yes
-preser=nobase -loc=file
```

Restores these directories and files:

```
/u/ann/file.a
/u/ann/file.b
/u/ann/file.x
/u/ann/file.y
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -preser=subtree
```

Restores these directories and files:

```
/u/ann/m1/file.a
/u/ann/m1/file.b
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -preser=none
```

Restores these directories and files:

```
/u/ann/file.a
/u/ann/file.b
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -su=yes
-preser=complete
```

Restores these directories and files:

```
/u/ann/h1/m1/file.a
/u/ann/h1/m1/file.b
/u/ann/h1/m1/l1/file.x
/u/ann/h1/m1/l1/file.y
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -su=yes -preser=nobase
```

Restores these directories and files:

```
/u/ann/file.a
/u/ann/file.b
/u/ann/l1/file.x
/u/ann/l1/file.y
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -su=yes -preser=subtree
```

Restores these directories and files:

```
/u/ann/m1/file.a
/u/ann/m1/file.b
/u/ann/m1/l1/file.x
/u/ann/m1/l1/file.y
```

This command:

```
dsmc res /fs/h1/m1/ /u/ann/ -su=yes -preser=none
```

Restores these directories and files:

```
/u/ann/file.a
/u/ann/file.b
/u/ann/file.x
/u/ann/file.y
```

Todate

Use the ***todate*** option with the ***totime*** option to specify an ending date and time. For example, you might request a list of files that were backed up before 11:59 PM on June 30, 2002.

Use the ***todate*** and ***totime*** options with the ***fromtime*** and ***fromdate*** options to request a list of backed up or archived files within a period of time. For example, you might request a list of files that were backed up between 6:00 AM on July 1, 2002 and 11:59 PM on July 30, 2002.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

date

Specifies an ending date. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc restore "/home/user1/*" -todate=12/11/2002
```

Totime

Use the ***totime*** option with the ***todate*** option to specify an ending time on a specified date. For example, you might request a list of files that were backed up before 11:59 PM on June 30, 2002. Tivoli Storage Manager ignores this option if you do not specify the ***todate*** option.

Use the ***totime*** and ***todate*** options with the ***fromtime*** and ***fromdate*** options to request a list of files that were backed up within a period of time. For example, you might request a list of files that were backed up between 6:00 AM on July 1, 2002 and 11:59 PM on July 30, 2002.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

time
Specifies an ending time. If you do not specify a time, the time defaults to 23:59:59. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc restore "/home/user1/*" -todate=09/17/2002 -totime=23:00:00
```

Type

Use the ***type*** option with the **query node** command to specify the type of node to query.

Supported Clients

This option is valid for the AIX, AIX 5L, and Solaris clients *only*. The Tivoli Storage Manager Client API does not support this option.

Syntax

Parameters

any
Specifies all nodes registered at the server. This is the default.

nas
Specifies all NAS nodes registered at the server.

server
Specifies client nodes that are other Tivoli Storage Manager servers.

client
Specifies client nodes that are backup-archive clients.

Examples

Command line:

```
q node -type=nas
```

V2archive

Use the *v2archive* option with the **archive** command to archive only files to the server. Tivoli Storage Manager will not process directories that exist in the path of the source file specification.

This option differs from the *filesonly* option in that the *filesonly* option archives the directories that exist in the path of the source file specification.

The *v2archive* and *dirsonly* options are mutually exclusive and an error message displays if you use both options in the same **archive** command.

This option is not persistent; you must explicitly specify this option in each **archive** command.

If you use this option, you may want to consider the following:

- You may experience performance problems when retrieving large amounts of data archived with this option.
- You may want to use this option only if you are concerned about expiration performance on a server that already contains extremely large amounts of archived data.

Note: The Tivoli Storage Manager Client API does not support this option.

Supported Clients

This option is valid for all UNIX clients.

Syntax

Parameters

There are no parameters for this option.

Examples

This command:

```
dsmc archive "/home/relx/dir1/*" -v2archive -su=y.
```

Archives these files:

```
/home/relx/dir1/file1
/home/relx/dir1/file2
/home/relx/dir1/file3
/home/relx/dir1/dir2/file4
/home/relx/dir1/dir2/file5
```

Note: Tivoli Storage Manager does not archive `/home/relx/dir1` and `/home/relx/dir1/dir2`.

Volinformation

The ***volinformation*** option backs up or archives root-level information. This option applies only when you back up or restore non-root files.

Specify ***volinformation*** either with the **selective** or the **archive** command, or any **incremental** command that does not target the entire volume. Entering the **incremental** command on an entire volume implicitly backs up the root-level information.

Supported Clients

This option is valid for all UNIX clients. The Tivoli Storage Manager Client API does not support this option.

Syntax

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc selective -vol
```

Chapter 11. Using Commands

Tivoli Storage Manager provides a command line interface (CLI) that you can use as an alternative to the graphical user interface (GUI). This chapter describes how to start or end a client command session and how to enter commands. It also provides detailed information about each command. Table 32 shows a list of tasks related to entering commands.

Table 32. Entering Commands

Task	Page
Starting and Ending a Client Command Session	273
Entering Client Commands	274
Remembering Previous Commands	276
Using Wildcard Characters	277

Table 33 provides an alphabetical list of the commands, a brief description, and where to locate more information.

Table 33. Commands

Command	Description	Page
archive	Archives files from a workstation to Tivoli Storage Manager storage.	279
backup image	Creates an image backup of one or more file systems or logical volumes that you specify.	280
backup nas	Creates an image backup of one or more file systems belonging to an NAS file server.	283
cancel process	Displays a list of current NAS backup and restore processes and permits you to select one process to cancel.	285
cancel restore	Displays a list of restartable restore sessions and permits you to select one to cancel.	286
delete access	Revokes authorization for a user to restore or retrieve files.	287
delete archive	Deletes archived files from Tivoli Storage Manager storage.	288
delete filespace	Deletes file spaces in Tivoli Storage Manager storage.	289
expire	Inactivates backup objects you specify.	291
help	Displays online command help.	292
incremental	Backs up new and changed files.	293
loop	Starts an interactive command session.	298
macro	Executes commands within a macro file you specify.	299
monitor process	Displays a list of current NAS backup and restore processes. You can then select one process to monitor.	300
query access	Displays a list of current authorization rules.	301

© Copyright IBM Corp. 1993, 2002

Table 33. Commands (continued)

Command	Description	Page
query archive	Displays a list of archived files.	302
query backup	Displays a list of backup versions.	303
query backupset	Queries a backup set from the server or a local file. A backup set can also be queried from a tape device.	305
query filespace	Displays a list of file spaces in Tivoli Storage Manager storage.	306
query image	Displays information regarding backed up images.	307
query inclexcl	Displays a list of include-exclude statements in the order in which they are processed during backup and archive operations.	308
query mgmtclass	Displays information about available management classes.	309
query node	Displays all the nodes for which a particular administrative user ID has authority to perform operations. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.	310
query restore	Displays a list of your restartable restore sessions in the server database.	311
query schedule	Displays information about scheduled events.	312
query session	Displays information about the current session.	313
restart restore	Displays a list of restartable restore sessions and permits you to select one to restart.	314
restore	Restores backup versions from Tivoli Storage Manager storage.	315
restore backupset	Restores a backup set from the server or a local file. You can also restore a backup from a tape device.	318
restore image	Restores a backed up image.	321
restore nas	Restores the image of a file system belonging to an NAS file server.	323
retrieve	Retrieves archived files from Tivoli Storage Manager storage.	325
schedule	Starts the client scheduler on the workstation.	327
selective	Backs up selected files.	329
set access	Authorizes another user to access your backup versions or archive copies.	331
set password	Changes the Tivoli Storage Manager password for your workstation.	333

Starting and Ending a Client Command Session

You can start or end a client command session in either batch mode or interactive mode. Use batch mode when you want to enter a *single* client command. Tivoli Storage Manager processes the command and returns to the shell command prompt.

Use interactive mode when you want to enter a *series* of commands. Since Tivoli Storage Manager establishes connection to the server only once for interactive mode, a series of commands can process more quickly. Tivoli Storage Manager processes the commands and returns to the **tsm>** prompt.

Process Commands in Batch Mode

When you enter a *single* command in batch mode, precede it with the executable program name, **dsmc**. Tivoli Storage Manager processes the command and returns to the shell command prompt. For example, to process the **incremental** command in batch mode, you would enter:

```
dsmc incremental
```

If a password is required, Tivoli Storage Manager prompts you each time you enter a command if the ***passwordaccess*** option is set to *prompt* and authentication on the server is set to *On*. Type your password and press Enter.

You can also enter your password using the ***password*** option with a command, but your password appears on the screen. For example, if your password is ***secret***, enter:

```
dsmc incremental –password=secret
```

If you set the ***passwordaccess*** option to *generate* in your `dsm.opt` file, you do not need to specify the password with the command. Tivoli Storage Manager *only* prompts you for your password if you are registering your workstation with a server or manually changing your password.

Process Commands in Interactive Mode

Use the *interactive* mode to enter a series of commands. Enter **dsmc** on the command line and press Enter. When the **tsm>** command prompt appears, type the command name and press Enter. *Do not* precede each command with the executable program name, **dsmc**. Alternatively, you can enter **dsmc loop** on the command line to start a client command session in interactive mode. **Loop** is the default command for **dsmc**.

If a password is required, Tivoli Storage Manager prompts you when you enter the first command. Type your user ID and password and press Enter. You can also enter your password using the ***password*** option with the **loop** command, but your password is displayed. For example, if your password is ***secret***, you would enter:

```
dsmc loop –password=secret
```

To end an interactive session, enter **quit** at the prompt.

Entering Client Commands

A client command can include one or more of these components:
- Command name
- Options
- Parameters

The sections that follow describe each of these components.

Command Name

The first part of a command is the command name. The command name consists of a single word, such as **help** or **schedule**, or an action word and an object for that action, such as **query archive**. Enter the full command name, or its minimum abbreviation. For example, you can enter any of the following versions of the **query schedule** command:

```
query schedule
q sc
q sched
query sc
```

Options

There are two groups of options that you can use with commands:

- **Client options**: The group of options that are set in your client options file (`dsm.opt`). To override an option in the client options file, enter the option with a command. For detailed information about client options, see Chapter 9, "Setting Processing Options" on page 107.
- **Client command options**: Use this group of options with specific commands on the command line *only*. For detailed information about client command options, see Chapter 10, "Using Options with Commands" on page 231.

Parameters

Commands can have required parameters, optional parameters, or no parameters at all. Required parameters provide information to perform a task. The most commonly required parameter is a file specification. For example, if you want to archive a file named `budget.fin` from the `/project` directory, you would enter:

```
dsmc archive /project/budget.fin
```

Some commands have optional parameters. If you do not enter a value for an optional parameter, Tivoli Storage Manager uses the default value. For example, the **restore** command includes a required parameter, *sourcefilespec*, that specifies the path and file name in storage that you want to restore. The optional parameter, *destinationfilespec*, specifies the path and file name where you want to place the restored files. If you do not specify the *destinationfilespec*, by default Tivoli Storage Manager restores the files to the original source path. If you want to restore the files to a *different* directory, enter a value for *destinationfilespec*. For example, to restore `/project/budget.fin` to `/newproj/newbudg.fin`, you would enter:

```
dsmc restore /project/budget.fin /newproj/newbudg.fin
```

Enter parameters in the order indicated in the command syntax diagram.

File Specification Syntax

Use the following syntax rules when entering file specification parameters, such as *filespec*, *sourcefilespec*, and *destinationfilespec*:

- If a file specification does not begin with a file space name (an opening directory delimiter), the file specification is assumed to be a subdirectory of the current working directory and Tivoli Storage Manager builds the fully qualified file specification. For example, if the current working directory is `/home/me`, then the *destinationfilespec* would be `/home/me/mydir` in the following command:

  ```
  dsmc restore "/fs/dir1/*" mydir/
  ```

- The only command that accepts a simple file space name is the **incremental** command. The following example is valid:

  ```
  dsmc i /fs
  ```

  The following example is *not* valid:

  ```
  dsmc sel /fs
  ```

- When entering the *sourcefilespec*, if the directory name ends with **/**, then **/*** is implied.

  When entering a *destinationfilespec*, if the name ends with **/**, then it is considered a directory, otherwise it is considered a file.

  The following example illustrates these two rules. Even though `mydir` and `yourdir` are directories, the command will fail because `/*` is implied after `mydir`, and `yourdir` is considered a file:

  ```
  restore /home/mydir/ /away/yourdir
  ```

  The following example illustrates the second rule. Even though `mydir` and `yourdir` are directories, the command will fail because `mydir` and `yourdir` are considered files:

  ```
  restore /home/mydir /away/yourdir
  ```

- Do not use wildcards as part of the file space name or anywhere in the *destinationfilespec*. The one exception to this rule is the **set access** command where wildcards are permitted in the two lowest-levels of the file spec. For example, use the following command to grant access to all files in and below the `/fs/dir1` directory:

  ```
  dsmc set access "/fs/dir1/*/*"
  ```

  Do not use wildcards for the directory path name, for example:

  ```
  /home/j*asler/file1.c
  ```

- The maximum number of characters for a file name is 256. The maximum number of characters for a path name is 1024 characters.
- The maximum number of file specifications per command:
  - The Query commands can accept only one file specification.
  - The **restore** and **retrieve** commands can accept a *sourcefilespec* and a *destinationfilespec*.
  - The **archive**, **delete archive**, **incremental**, and **selective** commands will accept up to 20 file specifications.

  Separate file specifications with a blank space.

Note: You can overcome these limitations by using the ***filelist*** option to process a list of files. The Tivoli Storage Manager client opens the file you specify with this option and processes the list of files within according to the specific command. See "Filelist" on page 242 for more information.

Maximum File Size for Operations

Table 34 on page 276 specifies the maximum file sizes for backup, restore, archive, and retrieve operations.

Table 34. Maximum File Size for Backup, Restore, Archive, and Retrieve

Platform	Max File Size (in bytes)
AIX	68,589,453,312 (64GB)
AIX 5L	68,589,453,312 (64GB)
HP-UX	1,099,511,627,775 (1TB-1)
Linux86 and 390	9,223,372,036,854,775,807 (8EB-1)
OS/390 UNIX	4,294,967,295 (4GB)
SGI	18,446,744,073,709,551,615 (16EB-1)
Solaris 2.6 or higher	1,099,511,627,775 (1TB-1)

Remembering Previous Commands

If you set the ***editor*** option to *yes* in your client options file `dsm.opt`, Tivoli Storage Manager permits you to recall and edit as many as 20 previously entered commands by using the Up arrow and Down arrow keys. If you set the ***editor*** option to *no*, the feature to recall previous commands is not active. If the editor and command retrieve functions are not working on a specific workstation setting, you should turn off the ***editor*** option. For more information regarding the ***editor*** option, see "Editor" on page 145.

Pressing the Up arrow key displays the previous command in memory. Pressing the Down arrow key displays the next command in memory. Table 35 lists other functions you can perform when you recall commands.

Table 35. Command Recall and Edit Functions

Function	Press
Display the previous command in memory.	Up arrow
Display the next command in memory.	Down arrow
Move to the beginning of the command.	Home
Move to the end of the command.	End
Move to the left.	Left arrow
Move to the right.	Right arrow
Move five spaces to the left.	Tab left
Move five spaces to the right.	Tab right
Move to the beginning of the previous word	Ctrl-left arrow or CTRL-L
Move to the beginning of the next word.	Ctrl-right arrow or CTRL-R
Delete a character to the right of the cursor.	Delete
Delete a character to the left of the cursor.	Backspace
Insert a character.	Toggle the Insert key
Erase to the end of the line.	Ctrl-delete or Ctrl-D
Finish or execute the command.	Enter
Quit the program.	F3 or Esc
End the program.	CTRL-C

Using Wildcard Characters

In a command, you can use wildcard characters in the file name or file extension *only*. You cannot use them to specify destination files, file systems, or directories. You cannot specify a directory whose name contains an asterisk (*) or a question Mark (?). Tivoli Storage Manager recognizes these characters only as wildcard characters. Use wildcard characters when you want to specify multiple files with similar names in *one* command. Without wildcard characters, you must repeat the command for each file. Valid wildcard characters that you can use include:

***** Asterisk. Matches zero or more characters.

? Question mark. Matches any single character at the present position.

Table 36 shows examples of each wildcard.

Table 36. Wildcard Characters

Pattern	Matches	Does Not Match
Asterisk (*)		
ab*	ab, abb, abxxx	a, b, aa, bb
ab*rs	abrs, abtrs, abrsrs	ars, aabrs, abrss
ab*ef*rs	abefrs, abefghrs	abefr, abers
abcd.*	abcd.c, abcd.txt	abcd, abcdc, abcdtxt
Question Mark (?)		
ab?	abc	ab, abab, abzzz
ab?rs	abfrs	abrs, abllrs
ab?ef?rs	abdefjrs	abefrs, abdefrs, abefjrs
ab??rs	abcdrs, abzzrs	abrs, abjrs, abkkkrs

Note: In batch mode, you must enclose values containing wildcards in double quotes. For example:

```
dsmc selective "/home/me/*.c"
```

Entering Commands

Follow the general rules below when you enter commands:

- Enter a maximum of 256 characters on the command line. Enter the characters in a continuous string. If you press the return key, the command will process.
- When you enter options with a command, always precede the option with a dash (–).
- Enter more than one option in any order in a command before or after the file specification. Separate multiple options with a blank space.

Client Commands Reference

The following sections contain detailed information about each of the Tivoli Storage Manager commands. These commands are arranged in alphabetical order. Information for each command includes:

- A description of the command.
- A syntax diagram of the command. The command name is shown in a combination of uppercase and lowercase characters. The uppercase characters

indicate the minimum abbreviation you can use for the command name. See "Reading Syntax Diagrams" on page xii for an explanation of these diagrams.

- Detailed descriptions of the command parameters. If the parameter is a constant (a value that does not change), the minimum abbreviation is shown in uppercase letters.
- Examples of using the command.

Archive

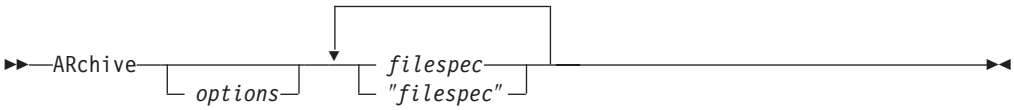
The **archive** command archives a single file, selected files, or all files in a directory and its subdirectories on a server.

Archive files that you want to preserve in their current condition. To release storage space on your workstation, delete files as you archive them using the ***deletefiles*** option. Retrieve the archived files to your workstation whenever you need them again.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options

You can use these command line options with the **archive** command: ***archmc, deletefiles, description, dirsonly, filelist***, and ***volinformation***. For more information about command line options, see Chapter 10, "Using Options with Commands" on page 231.

You can use the ***changingretries*** and ***subdir*** common options with the **archive** command. See Chapter 9, "Setting Processing Options" on page 107 for information about these common options.

filespec

Specifies path and name of the file you want to archive. You can use wildcards to specify groups of files or all the files in a directory. You can also enter up to 20 file specifications in a command. See "Maximum File Size for Operations" on page 275 for the maximum file size for archive processing.

Examples

Task Archive a single file named `budget` in the `/home/proj1` directory.

Command: `archive /home/proj1/budget`

Task Archive all files in the `/home/proj1` directory that contain a file extension of `.txt`.

Command: `archive "/home/proj1/*.txt"`

Task Archive all files in the directory tree headed by the `/home` directory.

Command: `archive -subdir=yes "/home/*"`

Backup Image

The **backup image** command creates an image backup of one or more volumes on your system.

Notes:
1. The Tivoli Storage Manager API must be installed to use the **backup image** command.
2. Image backup of the Sun QFS file system is not supported.

The Tivoli Storage Manager client must support the raw device type on the specific platform to perform an image backup of a raw device. You can only perform an image backup on local devices. Clustered devices or file systems as well as devices or file systems shared between two or more systems are not supported. If you want to perform an image backup for a file system mounted on a raw device, the raw device must be supported. See "Volume Device Type Support for an Image Backup" on page 63 for specific information about supported devices for the **backup image** command.

Use the **include.image** option to include a file system or logical volume for image backup, or to specify volume-specific options for image backup.

Offline and Online Image Backup

The traditional *offline* image backup prevents access to the volume by other system applications during the operation. Use the ***imagetype***=*dynamic* option to back up the volume *as is* without remounting it read-only. Corruption of the backup may occur if applications write to the volume while the backup is in progress. In this case, run **chdsk** after a restore.

For Linux86 *only*: Tivoli Storage Manager performs an *online* image backup of file systems residing on a logical volume created by the Linux Logical Volume Manager during which the volume is available to other system applications. Online image backup requires a Version 5.1 Tivoli Storage Manager server.

You can use the ***imagetype*** option with the **backup image** command or the ***include.image*** option to specify whether to perform an offline or online image backup. See "Imagetype" on page 161 for more information.

The Linux Logical Volume Manager allows the creation of a snapshot of a logical volume while the logical volume itself is still online. The snapshot is created inside the same volume group as the source logical volume. You must ensure that the volume group provides enough free disk space to create the snapshot. The snapshot contains the old data blocks while the modified data is stored in the source logical volume. Use the ***snapshotcachesize*** option with the **backup image** command, in the `dsm.opt` file, or with the ***include.image*** option to specify an appropriate snapshot size so that all old data blocks can be stored while the image backup occurs. A snapshot size of 100 percent will ensure a valid snapshot. See "Snapshotcachesize" on page 209 for more information.

Special Considerations when Backing Up Images

When using the **backup image** command, it is important to be aware of special considerations if you want to do either of the following:
- Perform point-in-time restores in the future
- Perform an image backup using ***mode***=*selective* or ***mode***=*incremental*.

If You Intend to Perform a Point-in-Time Restore Later: To ensure that you can perform point-in-time restores of your file systems, including deleting original files

which no longer exist on the logical volume, use a combination of full image backups and the **incremental** command as described in the steps below:

1. Perform a full incremental backup of the logical volume, for example:

   ```
   dsmc incremental /myfilesystem
   ```

2. Perform an image backup of the same logical volume, for example:

   ```
   dsmc backup image /myfilesystem
   ```

3. Periodically, perform incremental backups, for example:

   ```
   dsmc incremental /myfilesystem
   ```

You must follow these steps in the order shown to ensure that the server records additions and deletions accurately. The following command restores the file system to its exact state as of the last incremental backup:

```
dsmc restore image /myfilesystem -incre -del
```

If you do not follow the steps exactly, two things can occur:

- After the original image is restored, all files backed up with the **incremental** command are restored individually.
- If you perform a **backup image** before performing an **incremental**, files deleted from the original image are *not* deleted from the final restored file system.

Using the Mode Option: Two types of backup apply to logical volumes: ***mode***=*selective* (the default) and ***mode***=*incremental*. The ***mode***=*selective* option creates and sends a full backup copy of the logical volume to the server. The ***mode***=*incremental* option sends only those files that were added or changed since the last full image backup to the server. Tivoli Storage Manager ignores the -deletefiles option when the image+image incremental technique of backing up has been used.

If you use the **backup image** command, first with ***mode***=*selective* followed by one or more executions with ***mode***=*incremental*, use the ***incremental*** option with the **restore image** command to apply any changes made after the original image backup. The restore may include files that were later deleted plus the latest versions of files added or changed after the original image backup. If logical volumes are running at or near capacity, an out-of-space condition could result during the restore. For more information, see "Incremental-by-Date" on page 294. The ***deletefiles*** option is allowed on the **restore image** command, but the client ignores it because the server is not aware of any deleted files.

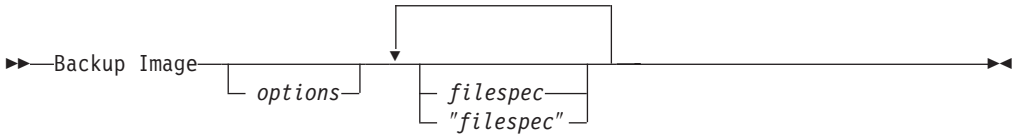
The following restrictions apply:

- The file system can have no previous full incremental backups produced by the **incremental** command.
- You can perform the backup only on volumes with mounted file systems; not on raw logical volumes.
- Incremental-by-date image backup does not inactivate files on the server; therefore, when files are restored, none can be deleted.
- If this is the first image backup for the file system, a full image backup is performed.
- Using ***mode***=*incremental* backs up only files with a changed date, not files with changed permissions.

Supported Clients

This command is valid for AIX, AIX 5L, HP/UX, Linux86, and Solaris *only*.

Syntax



Parameters

options
You can use the ***mode*** and ***imagetype*** command line options with the **backup image** command. For more information, see "Mode" on page 255.

You can also use these common options: ***domain.image, exclude.image, include.image, snapshotcachesize***. For information, see Chapter 9, "Setting Processing Options" on page 107.

filespec
Specifies the name of one or more logical volumes. If you want to back up more than one file system, separate their names with spaces. Do not use pattern matching characters. If you do not specify a file system, the logical volumes specified with the ***domain.image*** option will process. If you do not use the ***domain.image*** option to specify file systems to process, an error message displays and no image backup occurs.

Specify the file space over which the logical volume is mounted or the logical volume name. If there is a file system configured in the system for a given volume, you cannot back up the volume with the device name. For example, if `/dev/lv01` is mounted on `/home` you can issue `backup image /home` but backup image /dev/lv01 will fail with an error: `ANS1063E Invalid path specified`.

For Sun systems: Specify either a file system name or a raw device name (block device type).

Examples

Task Back up the `/home/test` file space over which the logical volume is mounted and perform an image incremental backup that backs up only new and changed files after the last full image backup.

Command: `dsmc backup image /home/test -mode=incremental`

Task Perform an offline image backup of the `/home` directory during which the volume is unmounted and remounted read only.

Command: `dsmc backup image /home -imagetype=static`

Task Back up the `/dev/lv01` raw logical volume.

Command: `dsmc backup image /dev/lv01`

Backup NAS

The **backup nas** command creates an image backup of one or more file systems belonging to a Network Attached Storage (NAS) file server. The NAS file server performs the outboard data movement. A server process starts in order to perform the backup.

Use the ***nasnodename*** option to specify the node name for the NAS file server. When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID. The NAS node name identifies the NAS file server to the Tivoli Storage Manager server; the NAS node name must be registered at the server. Place the ***nasnodename*** option in your client system options file `dsm.sys`. The value in the client system options file is the default, but can be overridden on the command line. See "Nasnodename" on page 178 for more information.

Use the ***mode*** option to specify whether to perform a full or differential NAS image backup. A full image backup backs up the entire file system. The default is a differential NAS image backup on files that change after the last full image backup. If an eligible full image backup does not exist, a full image backup is performed. See "Mode" on page 255 for more information.

Use the ***monitor*** option to specify whether you want to monitor a NAS file system image backup and display processing information on your screen. See "Monitor" on page 256.

Use the **monitor process** command to display a list of all processes for which an administrative user ID has authority. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.

Use the **cancel process** command to stop NAS back up processing. For more information, see "Cancel Process" on page 285.

Regardless of client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.

Supported Clients

This command is valid for AIX, AIX 5L, and Solaris clients *only*.

Syntax

Parameters

options
You can use these common options with the **backup nas** command: ***monitor***, ***nasnodename***, ***quiet***, ***verbose***. For more information, see Chapter 9, "Setting Processing Options" on page 107.

You can use the ***mode*** command line option with the **backup nas** command. For more information, see Chapter 10, "Using Options with Commands" on page 231.

filespec
Specifies the name of one or more file systems on the NAS file server. If you do not specify this parameter, Tivoli Storage Manager processes all of the file systems defined by the ***domain.nas*** option. For more information about this option, see "Domain.nas" on page 143.

If you do not specify the *filespec* or the ***domain.nas*** option, the default *all-nas* value is used for ***domain.nas*** and all file systems on the NAS file server are backed up.

Examples

Task Perform the NAS image backup of the entire file system.

Command:
```
backup nas -mode=full -nasnodename=nas1 /vol/vol0
/vol/vol2
```

Task Perform the NAS image backup of the entire file server.

Command:
```
backup nas -nasnodename=nas1
```

Cancel Process

The **cancel process** command displays a list of current backup and restore processes for all NAS nodes. This command only displays those processes for which the administrative user has authority. From the list, the administrative user can select one process to cancel. Client owner privilege over a particular NAS node is sufficient authority to cancel the selected NAS process.

When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID.

Supported Clients

This command is valid for AIX, AIX 5L, and Solaris clients *only*.

Syntax

Parameters

There are no parameters for this option.

Examples

Task Cancel a current NAS restore process.

Command: `cancel process`

Cancel Restore

The **cancel restore** command displays a list of your restartable restore sessions in the server database. You can only cancel one restartable restore session at a time. Run the **cancel restore** command again to cancel additional restores. To restart restartable restore sessions, use the **restart restore** command.

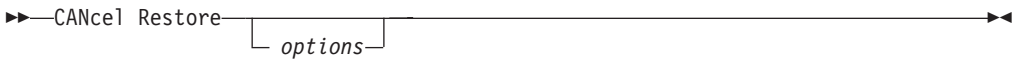
Use the **cancel restore** command when:

- You cannot back up files affected by the restartable restore.
- Restartable restore sessions lock the file space so that files cannot be moved off sequential volumes.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
See Chapter 9, "Setting Processing Options" on page 107 for information about common options that you can use with the **cancel restore** command.

Examples

Task Cancel a restore operation.

Command: `cancel restore`

Delete Access

The **delete access** command deletes authorization rules for files or images that are stored on the server. When you delete an authorization rule, you revoke user access to any files or images specified by that rule.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
For information about common options that you can use with this command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display a list of current authorization rules and select the rules you want to delete.

Command: `delete access`

See the following screen example:

```
Index   Type       Node    Owner   Path
_____   _______    ____________________________
1       Backup     NODE1   USER1   home/dev/proja/list/
2       Archive    NODE3   LUIE    home/fin/budg/depta/
3       Backup     NODE4   USER2   home/plan/exp/deptc/
4       Archive    NODE5   USER2S  home/mfg/invn/parta/
Enter Index of rule(s) to delete, or quit to cancel:
```

To delete the authorization rules that let **luie** and **user2s** access your files or images, type: **2 4** or **(2,4)** and press Enter.

Delete Archive

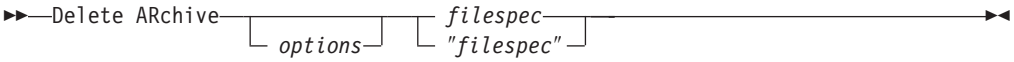
The **delete archive** command deletes archived files from server storage. Your administrator must give you authority to delete archived files.

Attention: When you delete archived files, ***you cannot retrieve them.*** Verify that the files are obsolete *before* you delete them.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **delete archive** command: ***description***, ***filelist***, ***noprompt***, ***pick***. For more information about command line options, see Chapter 10, "Using Options with Commands" on page 231.

You can use the ***subdir*** common option with the **delete archive** command. For information about common options, see Chapter 9, "Setting Processing Options" on page 107.

filespec
Specifies the path and file name that you want to delete from storage. Use wildcard characters to specify a group of files or all files in a directory. You can also enter up to 20 file specifications in a command

Examples

Task Delete a file named `budget`.

Command: `del ar /user/home/proj1/budget`

Task Delete all files archived from the `/user/home/proj1` directory with a file extension of `.txt`.

Command: `del arch "/user/home/proj1/*.txt"`

Task Delete files archived from the `/user/project` directory using the ***pick*** option.

Command: `d ar "/user/project/*" -pick`

Delete Filespace

Authorized User

The **delete filespace** command deletes file spaces from server storage. A *file space* is a logical space on the server that contains files or images you backed up or archived. Tivoli Storage Manager assigns a separate file space on the server for each workstation file system from which you back up or archive files. The file space name is the same as the file system name. When you enter the **delete filespace** command, a list of your file spaces displays. From this list, select the file space that you want to delete.

Your administrator must give you authority to delete a file space. You need BACKDEL authority if the file space you want to delete contains backup versions, or ARCHDEL authority if the file space contains archive copies. If the file space contains *both* backup versions and archive copies, you need both types of authority.

Deleting NAS File Spaces

You can use the **delete filespace** command to interactively delete NAS file spaces from server storage.

Use the ***nasnodename*** option to identify the NAS file server. When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID. Place the ***nasnodename*** option in your client system options file `dsm.sys`. The value in the client system options file is the default, but this value can be overridden on the command line. If the ***nasnodename*** option is not specified in the client system options file, you must specify this option on the command line when processing NAS file systems. See "Nasnodename" on page 178 for more information.

Use the ***class*** option to specify the class of the file space to delete. To display a list of file spaces belonging to a NAS node so that you may choose one to delete, use the ***-class***=*nas* option. Using the default, ***-class***=*client*, will not change the current **delete filespace** behavior. See "Class" on page 237 for more information.

To delete NAS file spaces using the Web client, see Chapter 4, "Backing Up Files and Directories" on page 53.

Attention: When you delete a file space, you delete *all* backup versions and archive copies within that file space. When you delete a file space, ***you cannot restore the files or images***. Verify that the files or images are obsolete *before* you delete them.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options

You can use these common options with the **delete filespace** command: ***scrollprompt*** and ***scrolllines***. For more information, see Chapter 9, "Setting Processing Options" on page 107.

You can use the ***class***, ***nasnodename***, and ***detail*** command line options with the **delete filespace** command. For more information, see "Class" on page 237.

Examples

Task Delete a file space.

Command: `delete filespace`

Task Delete NAS file spaces from the **dagordon** NAS file server stored on the server.

Command: `delete filespace -nasnodename=dagordon -class=nas`

Expire

The **expire** command inactivates the backup objects you specify in the file specification or with the ***filelist*** option.

When working in interactive mode, a prompt notifies you before files are expired.

The **expire** command does not remove workstation files. If you expire a file or directory that still exists on your workstation, the file or directory is backed up again during the next incremental backup unless the object is excluded by include-exclude processing.

If you expire a directory that contains active files, those files will not appear in a subsequent query from the GUI. However, these files will display on the command line if you specify the proper query with a wildcard character for the directory.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
You can use these command line options with the **expire** command: ***pick*** and ***filelist***. For more information about command line options, see Chapter 10, "Using Options with Commands" on page 231.

Note: If the user specifies ***filelist***, then ***pick*** is ignored.

filespec
Specifies a path and a filename that you want to expire. You can enter only one file specification on this command. However, you can use wildcards to select a group of files or all the files in a directory. If you specify the ***filelist*** option, the `filespec` designation is ignored.

Examples

Task Inactivate the `letter1.txt` file in the `home` directory.

Command: `expire "u/home/letter1.txt"`

Task Inactivate all files in the `admin/mydir` directory.

Command: `expire u/admin/mydir/*`

Help

The **help** command displays a Table of Contents of help topics for the command line client. Enter the number of the topic that you want to view. If there is more than one screen of topics, scroll backward or forward through the list. To exit, type **q** and press Enter.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
For information about common options that you can use with this command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display a list of help choices.

Command: `help`

Incremental

The **incremental** command backs up all new or changed files or directories in the default client domain or from file systems, directories, or files you specify, unless you exclude them from backup services.

To incrementally back up selected files or directories, enter a file specification in the command. If you do not enter a file specification, the default is to back up files or directories in the default domain.

The following attributes in the management class assigned to the file or directory affect whether the data is actually backed up:

Frequency
The number of days that must elapse between successive backups for the file. Use this attribute during a full incremental backup.

Mode Permits you to back up only files that changed since the last backup (*modified*). Also permits you to back up the files whether they changed or not (*absolute*).

Serialization
Permits or denies backup of files or directories according to the following values:
- **static**: In order to be backed up, data must not be modified during backup or archive.
- **shared static**: If data in the file or directory changes during each of the allowed attempts to back up or archive it, it is not backed up or archived. The value of the ***changingretries*** option determines how many attempts are made. The default is 4.
- **dynamic**: The object is backed up or archived on the first attempt whether or not data changes during the process.
- **shared dynamic**: The object is backed up or archived on the last attempt, even if data changes during the process.

For more information on management classes, see Chapter 8, "Understanding Storage Management Policies" on page 97.

Using the ***include*** option in an include-exclude list, you can assign the default management class to a file. You can also assign a specific management class to a file.

You can perform either a *full incremental* backup or an *incremental by date* backup. The default is a full incremental backup.

You can also use the **selective** command to perform a *selective* backup that backs up only the files, directories or empty directories that you specify. For more information, see "Selective" on page 329.

A full incremental backs up all files or directories that are new or have changed since the last incremental backup. During a full incremental backup, the client queries the server to determine the exact condition of your storage. Tivoli Storage Manager uses this information to:
- Back up new files or directories.
- Back up files or directories whose contents have changed.
- Mark inactive backup versions on the server for files or directories that are deleted from the workstation.

- Rebind backup versions to management classes if the management class assignments change.

Incremental-by-Date

An incremental-by-date backup backs up new and changed files with a modification date later than the date of the last incremental backup stored at the server, unless the files are excluded from backup by an **exclude** statement.

If an incremental-by-date is performed on only part of a file system, the date of the last full incremental is not updated, and the next incremental-by-date will back up these files again. Changes to the access control lists (ACL) are not backed up during an incremental-by-date. Use the **query filespace** command to determine the date and time of the last incremental backup of the entire file system.

To perform an incremental-by-date backup, use the ***incrbydate*** option with the **incremental** command.

Unlike a full incremental, an incremental-by-date does not maintain current server storage of *all* your workstation files because:

- It does not expire backup versions of files that are deleted from the workstation.
- It does not rebind backup versions to a new management class if the management class has changed.
- It does not back up files with attributes that have changed, unless the modification dates and times have also changed.
- It ignores the copy group frequency attribute of management classes.

For these reasons, if you have limited time during the week to perform backups, but extra time on the weekends, you can perform an incremental-by-date backup on weekdays and a full incremental backup on weekends to maintain current server storage of your workstation files.

If the **incremental** command is retried because of a communication failure or session loss, the transfer statistics will display the number of bytes Tivoli Storage Manager attempted to transfer during *all* command attempts. Therefore, the statistics for bytes transferred may not match the file statistics, such as those for file size.

Supported File Systems and ACL Support

Special file systems contain dynamic information generated by the operating system; they contain no data or files. The UNIX client ignores special file systems and their contents. Special file systems include the following:

- the `/proc` file system on most of the UNIX platforms
- the `/dev/fd` file system on Solaris and SGI
- the `/dev/pts` on Linux

Tivoli Storage Manager provides ACL support for the client file systems in Table 37.

Table 37. Supported File Systems and ACL Support

Platform	File System	ACL Support
AIX	jfs	yes
	gpfs	yes
	afs/dfs	yes
	JFS2	yes

Table 37. Supported File Systems and ACL Support (continued)

Platform	File System	ACL Support
AIX 5L	jfs	yes
	gpfs	yes
	afs/dfs	yes
	JFS2	yes
HP-UX	hfs	yes
	VxFS (JFS Veritas)	yes (V3.3.Layout 4)
Linux86	ext2	no
	ext3	no
	jfs	no
	reiserfs	no
Linux/390	ext2	yes
	ext3	no
	jfs	no
OS/390 UNIX	hfs	no
	zfs	yes
SGI	efs	no
	xfs	yes
Solaris	ufs	yes
	VxFS	yes
	QFS	no

Beginning with Version 3.7.2, Tivoli Storage Manager provides full ACL support for GPFS file systems on the AIX client and XFS file systems on the SGI client. Files with an ACL set, backed up with a Version 3.7.1 or lower client, must be backed up again even if the files have not changed. This updates the ACL data on the server.

Notes:

1. The standalone package LSCqfs 3.5.0 is the only supported version of QFS. In addition, the following restrictions also apply to the QFS file system:
   - Image Backup is not supported on QFS file systems.
   - The Solaris backup-archive client does not support the combination of QFS and SAM needed to archive files onto tertiary background storage, such as tapes. Instead, it recalls files from tape to disk automatically if it finds migrated files during a backup.
   - A QFS file system contains two hidden system files and a system directory that cannot be backed up. This is acceptable because a backup of these files is not needed. They contain internal data to manage the file system. This data will be automatically excluded from a backup and recreated automatically by the file system itself if a restore of files in that file system is invoked.

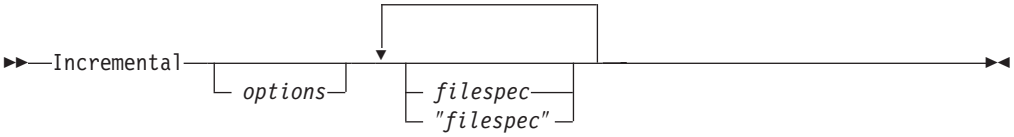
Attention: If you are running GPFS for AIX in a multi-node cluster, and all nodes share a mounted GPFS file system, Tivoli Storage Manager processes this file system as a local file system. Tivoli Storage Manager backs up the file system on each node during an incremental backup. To avoid this, you can do *one* of the following:

- Explicitly configure the ***domain*** statement in the client system options file `dsm.sys` to list the file systems you want that node to back up.
- Set the ***exclude.fs*** option in the client system options file `dsm.sys` to exclude the GPFS file system from backup services.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **incremental** command: ***dirsonly, filelist, filesonly, incrbydate, volinformation***. For more information, see Chapter 10, "Using Options with Commands" on page 231.

You can use these common options with the **incremental** command: ***changingretries***, ***domain***, , ***memoryefficientbackup***, ***subdir***, , ***tapeprompt***. For information about these options, see Chapter 9, "Setting Processing Options" on page 107.

filespec
Specifies the path and file name that you want to back up. Use wildcards to select a group of files or all the files in a directory. You can also enter up to 20 file specifications in a command by separating the file specifications with a space. If you do not specify a file specification, the default domain or the domain specified as an option is backed up.

If you specify a file system, all new and changed files are backed up. In addition, the last incremental date for the file space is updated on the server. If you specify a file or directory, the last incremental date is not updated. This means the file or directory might be backed up again if a later backup is performed using the ***incrbydate*** option.

If you specify a file system, specify the file system without a trailing slash.

Examples

Task Run an incremental backup of the default client domain specified in your client user options file (`dsm.opt`).

Command: `Incremental`

Task Run an incremental backup for the `/home`, `/usr`, and `/proj` file systems.

Command: `Incremental /home /usr /proj`

Task Run an incremental backup for the `/proj/test` directory.

Command: `Incremental /proj/test/`

Task Run an incremental-by-date backup for the `/home` file system.

Command: `Incremental -incrbydate /home`

Task Run an incremental backup of all files in the `/fs/dir1` directory that begin with the string abc.

Command: `Incremental -subdir=yes "/fs/dir1/abc*"`

Task Run an incremental backup of the abc file in the `/fs/dir1` directory.

Command: `Incremental -subdir=yes /fs/dir1/abc`

Task Run an incremental backup of the directory object `/fs/dir1`, but not any of the files in the `/fs/dir1` directory.

Command: `Incremental /fs/dir1`

Task Run an incremental backup of the directory object `/fs/dir1` and all of the files in the `/fs/dir1` directory.

Command: `Incremental -subdir=yes /fs/dir1/`

Loop

The **loop** command starts an interactive command line session that is maintained until you enter **quit**. In an interactive command line session, it is unnecessary to precede each command name with **dsmc** and your password, if one is required. After you start an interactive session, most of the options you enter with other commands are in effect throughout the session, unless you enter them again using a different setting.

You can enter all valid commands in interactive mode *except* the **schedule** and **loop** commands.

There are some options that you cannot use in the interactive session created by the **loop** command and are identified in the option description by this statement: *This option is valid only on the initial command line. It is not valid in interactive mode.*

See Chapter 9, "Setting Processing Options" on page 107 for options that you cannot use in interactive mode.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
For information about command line and common options that you can use with this command, see Chapter 10, "Using Options with Commands" on page 231 and Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Start an interactive command line session.

Command: `dsmc`

At the **tsm>** prompt, enter a command.

Macro

The **macro** command executes a series of commands that you specify in a macro file. By including the **macro** command within a macro file, you can nest as many as ten levels of commands.

Comment lines are not supported within the macro file that you specify for the **macro** command.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

macroname
Specifies the fully qualified name of the file containing the commands.

Examples

The following is an example of how to use the **macro** command.

Task Selectively back up files in the following directories:

```
/devel/project/proja
/devel/project/projb
/devel/project/projc
```

Command:

```
macro backabc.mac
```

where `backabc.mac` contains the following statements:

```
Selective /devel/project/proja/
Selective /devel/project/projb/
Selective /devel/project/projc/
```

Monitor Process

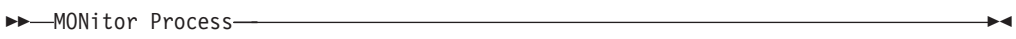
The **monitor process** command displays a list of current backup and restore processes for all NAS nodes for which the administrative user has authority. The administrative user can then select one process to monitor. Client owner privilege over a particular NAS node is sufficient authority to monitor the selected NAS process.

When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID.

Supported Clients

This command is valid for AIX, AIX 5L, and Solaris clients *only*.

Syntax



Parameters

There are no parameters for this command.

Examples

Task Monitor a current NAS backup process.

Command: `monitor process`

Query Access

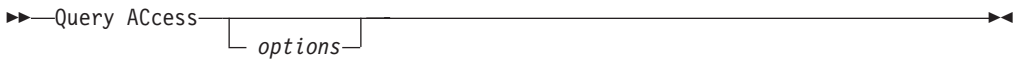
The **query access** command displays a list of users to whom you have given access to backup versions or archive copies of specific files. Tivoli Storage Manager displays a list of authorization rules that you defined with the **set access** command or with ***User Access List*** on the graphical user interface (GUI) Utilities menu. The information includes:

- Authority you gave a user to restore backup versions or retrieve archive copies.
- The node name of the user to whom you gave authorization.
- The ID of the user at that node to whom you gave authorization.
- The files to which the user has access.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use the following common options with the **query access** command: ***scrolllines, scrollprompt***. For more information about common options you can use with this command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display a list of users who have access to your files.

Command: `query access`

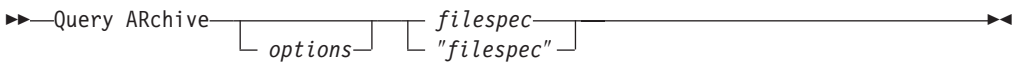
Query Archive

The **query archive** command displays a list of your archived files, the file size, archive date, file specification, expiration date, and file description.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **query archive** command: ***description, dirsonly, filelist, filesonly, fromdate, fromnode, fromowner, fromtime, todate, totime***. For more information, see Chapter 10, "Using Options with Commands" on page 231.

You can use these common options with the **query archive** command: ***scrolllines***, ***scrollprompt***, ***subdir***. See Chapter 9, "Setting Processing Options" on page 107 for more information..

filespec
Specifies the path and file name that you want to query. Use wildcard characters to specify a group of files or all the files in a directory. If you use wildcard characters, enclose the file specification in double quotation marks. Specify an asterisk (*) to query all archived files in the current directory.

Examples

Task Display a list of all your archived files in the current working directory.

Command: `q archive "*"`

Task Display a list of all your archived files in the `/devel` directory and all of its subdirectories.

Command: `query archive "/devel/*" -subdir=yes`

Task Display a list of all your archived files in the current directory. Use the ***dateformat*** and ***timeformat*** options to reformat the dates and times.

Command: `q ar –date=5 –time=1 "*"`

Task Display a list of archived files in the `/home/proj` directory whose first four characters of the file name begin with `proj`. Use the ***dateformat*** and ***timeformat*** options.

Command: `q ar -date=1 -time=4 "/home/proj/proj*"`

Query Backup

The **query backup** command displays a list of backup versions of your files. File information includes the file specification, size, backup date, whether the file is active or inactive, and the management class assigned to the file. Only the first ten characters of the management class name are displayed.

Querying NAS File System Images

You can use the **query backup** command to display information about file system images backed up for a NAS file server.

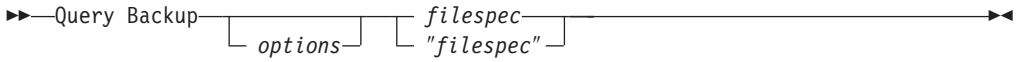
Use the ***nasnodename*** option to identify the NAS file server to query. When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID. Place the ***nasnodename*** option in your client system options file `dsm.sys`. The value in the client system options file is the default, but this value can be overridden on the command line. See "Nasnodename" on page 178 for more information.

Use the ***class*** option to specify the class of the file space to query. To display a list of images belonging to a NAS node, use the ***-class***=*nas* option. Using the default, ***-class***=*client*, will not change the current **query backup** behavior. See "Class" on page 237 for more information.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **query backup** command: ***class, dirsonly, filelist, filesonly, fromdate, fromnode, fromowner, fromtime, inactive, pitdate, pittime, todate, totime***. For more information, see Chapter 10, "Using Options with Commands" on page 231.

You can use these common options with the **query backup** command: ***subdir***, ***scrolllines, nasnodename, scrollprompt***. See Chapter 9, "Setting Processing Options" on page 107 for information about these common options.

filespec
Specifies the path and file name that you want to query. Use wildcard characters to specify a group of files or all the files in a directory. If you use wildcard characters, enclose the file specification in double quotation marks. Specify an asterisk (*) to display information about backup versions for all of your files in the current directory. Do not use wild cards when you query NAS file system images with ***-class***=*nas* option.

Examples

Task Display a list of all active and inactive backup versions of your files in the current directory.

Command: `query backup –inactive "*"`

Task Display a list of files that were backed up from the `/home/proj` directory with file names that begin with `proj`. Use the ***dateformat*** and ***timeformat*** options.

Command: `q b–date=1 –time=4 "/home/proj/proj*"`

Task Display a list of active and inactive backup file versions in the `/home` file system. Use the ***dateformat*** and ***timeformat*** options.

Command: `q b–date=5 –time=1 –ina –su=yes /home/`

Task Query file system images from the **nas2** NAS file server.

Command: `query backup -nasnodename=nas2 -class=nas`

Query Backupset

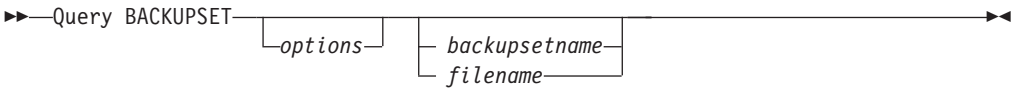
The **query backupset** command queries a backup set from a local file, tape device, or the server. See "Location" on page 254 for information on how to specify supported tape devices. This command displays the backup set name, generation date, retention, and description.

You can use this command to query backup sets on a tape device with AIX, AIX 5L, Solaris, and HP clients *only*.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **query backupset** command: ***description*** and ***location***. See Chapter 10, "Using Options with Commands" on page 231 for information about these command line options.

You can use these common options with the **query backupset** command: ***scrolllines*** and ***scrollprompt***. See Chapter 9, "Setting Processing Options" on page 107 for information about these common options.

backupsetname
Specifies the name of the backup set on the server you want to query when *-**location**=server* is in effect. You can use wildcards to specify the backup set name. If you do not specify a backup set name, all backup sets display.

filename
Specifies the file name on your local workstation that contains the backup set you want to query when *-**location**=file* is in effect.

Examples

Task Query a backup set on the server called `mybackupsetname` on the server.

Command:
```
query backupset "mybackupsetname" -loc=server
```

Task Query the backup set in the `backupsetfile.name` file in the `budget` directory.

Command:
```
dsmc query backupset "/home/budget /backupsetfile.name"
-loc=file
```

Task Query the backup set on the `/dev/rmt0` tape device.

Command:
```
dsmc query backupset /dev/rmt0 -loc=tape
```

Query Filespace

The **query filespace** command displays a list of file spaces for a node stored on the server. A *file space* is a logical space on the server that contains files you backed up or archived. Tivoli Storage Manager assigns a separate file space on the server for each file system at your workstation from which you back up or archive files. The file space name is the same as the file system name.

Querying NAS File Spaces

Use the ***nasnodename*** option to identify the NAS file server to query. When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID. Place the ***nasnodename*** option in your client system options file dsm.sys. The value in the client system options file is the default, but this value can be overridden on the command line. If the ***nasnodename*** option is not specified in the client system options file, it must be specified on the command line when processing NAS file systems. See "Nasnodename" on page 178 for more information.

Use the ***class*** option to specify the class of the object to query. To display a list of file spaces belonging to a NAS node, use the ***-class***=*nas* option. Using the default, ***-class***=*client*, will not change the current **query filespace** behavior. See "Class" on page 237 for more information.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options

You can use the ***fromnode***, ***detail***,***class***, and ***nasnodename***, command line options with the **query filespace** command. For more information, see "Fromnode" on page 246, "Detail" on page 240and "Class" on page 237.

You can use the ***scrolllines*** and ***scrollprompt*** common options with the **query filespace** command. See Chapter 9, "Setting Processing Options" on page 107 for more information..

Examples

Task Display your file spaces.

Command: query filespace

Task Display your file spaces. Use the ***dateformat*** and ***timeformat*** options to reformat the dates and times.

Command: `query filespace –date=5 –time=4`

Task Query a file space from the **nas2** NAS file server.

Command: `query filespace -nasnodename=nas2 -class=nas`

Query Image

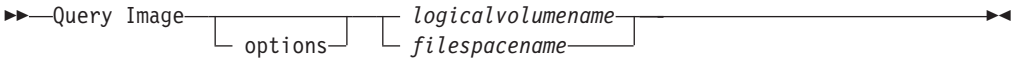
The **query image** command displays information about images backed up by a client. The options are used to determine the content and detail of the information.

Note: The Tivoli Storage Manager API must be installed to use the **query image** command.

Supported Clients

This command is valid for AIX, AIX 5L, HP/UX, Linux86, and Solaris *only*.

Syntax



Parameters

options
You can use these command line options with the **query image** command: ***inactive, fromnode, fromowner***. See Chapter 10, "Using Options with Commands" on page 231 for information about these command line options.

You can also use the ***scrolllines*** and ***scrollprompt*** common options with the **query image** command. For more information about these common options, see Chapter 9, "Setting Processing Options" on page 107.

logicalvolumename
The name of a logical volume you want to query. You must specify the exact name of the image. You cannot use wildcards. The default is all active images (unless restricted by one or more options).

filespacename
Specifies the file system name that you want to query.

Omitting *logicalvolumename* and *filespacename* causes all images to display.

Examples

Task Display all backed up images.

Command: `q image`

Task Display all backed up images owned by **kutras** at node avalon.

Command: `query image -fromnode=avalon -fromowner=kutras`

Task Display active and inactive version of the `/usr` image.

Command: `q i /usr -inactive`

Query Inclexcl

The **query inclexcl** command displays a list of include-exclude statements in the order in which they are processed during backup and archive operations. The list displays the type of option, the scope of the option (archive, all, etc.), and the name of the source file.

You can test the validity of patterns you wish to use in your include-exclude list before you actually insert them in your options file. See the *test pattern* explanation below.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

test pattern
Use for testing the validity of patterns you wish to use in your include-exclude list. When you use a test pattern with this command, the following occurs:

- The internal include-exclude list is *not* displayed
- The pattern is processed as if it had come from an include-exclude statement, including all the usual error checking
- The pattern is displayed as it would appear in the include-exclude list

If the test pattern has no errors, the compiled pattern result is the same as the test pattern.

Examples

Task Display a list of include-exclude statements.

Command: `query inclexcl`

Task Test the validity of this pattern: `/.../?x?/*.log`

Command: query inclexcl `/.../?x?/*.log`

Query Mgmtclass

The **query mgmtclass** command displays information about the management classes available in your active policy set.

Your administrator defines management classes that contain attributes controlling whether a file is eligible for backup or archive services. Management classes also determine how backups and archives are managed on the server.

Your active policy set contains a default management class; it can contain any number of additional management classes. You can assign specific management classes to files using ***include*** options that are located in the client user options file `dsm.opt`. If you do not assign a management class to a file, Tivoli Storage Manager uses the default management class.

When you archive files, you can override the assigned management class by using the ***archmc*** option.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
You can use the ***detail*** and ***fromnode*** command line options with the **query mgmtclass** command. For more information, see Chapter 10, "Using Options with Commands" on page 231.

Examples

Task Display default and available management classes.

Command: `query mgmtclass`

Query Node

The **query node** command displays all the nodes for which an administrative user ID has authority to perform operations. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.

When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID.

Use the ***type*** option to specify the type of node to filter for. Valid values are *nas*, *client*, *server* and *any*. The default is *any*. See "Type" on page 267 for more information.

Supported Clients

This command is valid for AIX, AIX 5L, and Solaris clients *only*.

Syntax

Parameters

options

You can use the ***type*** command line option with the query node command. See "Type" on page 267 for more information.

Use the ***scrolllines*** and ***scrollprompt*** common options with the **query node** command. For more information, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display all NAS nodes.

Command: `query node -type=nas`

Query Restore

The **query restore** command displays a list of your restartable restore sessions in the server database. The list contains these fields: owner, replace, subdir, preservepath, source, and destination.

A restartable restore session is created when a wildcard restore command fails because of network outage, client failure, server outage, or a similar problem. When such a failure occurs, the file space is locked on the server and its files cannot be moved off the server's sequential volumes. To unlock the file space, either restart the restore and allow it to complete (**restart restore** command), or cancel the restore (**cancel restore** command). Use **query restore** to determine if you have any restartable restore sessions and which file spaces are affected.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
For information about common options you can use with the **query restore** command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display your restartable restore session in the server database.

Command: `query restore`

Query Schedule

The **query schedule** command displays the events scheduled for your node. Your administrator can set up schedules to perform automatic backups and archives for you. To plan your work, use this command to determine when the next scheduled events occur.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
You can use the ***dateformat*** common option with the **query schedule** command. See "Dateformat" on page 133 for more information.

Examples

Task Display your scheduled events.

Command: `query schedule`

Query Session

The **query session** command displays information about your session, including the current node name, when the session was established, server information, and server connection information.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
For information about common options you can use with the **query session** command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Display your session information.

Command: `query session`

A sample **query session** display follows:

```
Tivoli Storage Manager
Command Line Backup Client Interface - Version 3, Release 7,
Level 0.0 (C) Copyright IBM Corporation, 1990, 1999 All
Rights Reserved.

Node Name: EPSILON3
Session established with server FIJI_0918GA: AIX-RS/6000
  Server Version 3, Release 1, Level 0.0
  Server date/time: 09/04/1999 15:09:52
  Last access: 09/04/1999 15:09:40

Server Connection Information

Server Name.............: FIJI_0918GA
Server Type.............: AIX-RS/6000
Server Version..........: Ver. 3, Rel. 1, Lev. 0.0
Last Access Date........: 09/04/1999 15:09:40
Delete Backup Files.....: Yes
Delete Archive Files....: Yes

Node Name...............: EPSILON3
User Name...............: thompson
```

Restart Restore

The **restart restore** command displays a list of your restartable restore sessions in the server database. You can only restart one restartable restore session at a time. Run the **restart restore** command again to restart additional restores.

The restarted restore uses the same options you used in the failed restore. The restarted restore continues from the point at which the restore previously failed.

To cancel restartable restore sessions, use the **cancel restore** command. Use the **restart restore** command when:

- Restartable restore sessions lock the file space at the server so that files cannot be moved off the server's sequential volumes.
- You cannot back up files affected by the restartable restore.

Options from the failed session supersede new or changed options for the restarted session.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options

For information about common options you can use with the **restart restore** command, see Chapter 9, "Setting Processing Options" on page 107.

Examples

Task Restart a restore.

Command: `restart restore`

Restore

The **restore** command obtains copies of backup versions of your files from a server. To restore files, specify the directories or selected files, or select the files from a list. Restore files to the directory from which you backed them up or to a different directory. Tivoli Storage Manager uses the ***preservepath*** option with the *subtree* value as the default for restoring files. For more information, see "Preservepath" on page 262.

Note: On UNIX systems when a symbolic link is created its modification time is set to the current system time and cannot be changed. So, when restoring a symbolic link its modification date and time is set to the date and time of the restore, not to the date and time the link had when it was backed up. As a result, Tivoli Storage Manager will back up the symbolic link during the next incremental backup because its modification time changed since the last backup.

If you set the ***subdir*** option to *yes* when restoring a specific path and file, Tivoli Storage Manager recursively restores *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

When you restore an entire directory or directory tree, and you do not specify the ***inactive***, ***latest***, ***pick***, ***todate***, and ***fromdate*** options on the **restore** command, Tivoli Storage Manager tracks which objects are restored. If the restore process is interrupted for any reason, you can restart the restore at the point of interruption by entering the **restart restore** command. It is possible to create more than one restartable restore session. Restores are only restartable if the *filespec* is fully wildcarded. For example, for a restore which is restartable, enter:

```
dsmc rest /home/* -sub=yes
```

For a restore which is not restartable, enter:

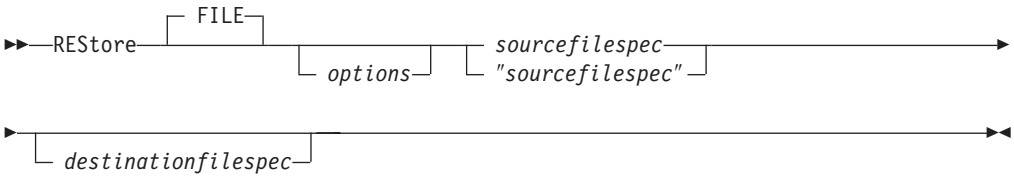
```
dsmc rest /home/file?.c -sub=yes
```

Use the **query restore** command to display a list of your restartable restore sessions in the server database. Further backups of the file system cannot be performed unless the restartable restore completes using the **restart restore** command or is cancelled using the **cancel restore** command.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

file
This parameter specifies that the source file specification is an explicit filename.

This parameter is required when you restore a file name from the current path, when you do not specify a relative or absolute path, and when the file name conflicts with one of the reserved **restore** command keywords, such as **restore *backupset***. See "Maximum File Size for Operations" on page 275 for the maximum file size for restore processing.

options
You can use these command line options with the **restore** command: ***dirsonly, filelist, filesonly, fromdate, fromnode, fromowner, fromtime, ifnewer, inactive, latest, pick, pitdate, pittime, preservepath, todate, totime***. For more information, see Chapter 10, "Using Options with Commands" on page 231.

You can use these common options with the **restore** command: ***replace, subdir***. See Chapter 9, "Setting Processing Options" on page 107 for information about common options.

sourcefilespec
Specifies the path and file name in storage that you want to restore. Use wildcard characters to specify a group of files or all the files in a directory.

destinationfilespec
Specifies the path and file name where you want to place the retrieved files. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path.

Examples

Task Restore a single file named `budget`.

Command: `restore /home/devel/projecta/budget`

Task Restore a single file named `budget` which resides in the current directory.

Command: `restore file budget`

Task Restore all files with a file extension of `.c` from the `/home/devel/projecta` directory.

Command: `restore "/home/devel/projecta/*.c"`

Task Restore files in the `/user/project` directory. Use the ***pick*** and ***inactive*** options to select active and inactive backup versions.

Command: `restore "/user/project/*" -pick -inactive`

Task Restore all files from the `/home/devel/projecta` directory that end with the character `.c` to the `/home/newdevel/projectn/projecta` directory. If the `projectn` or the `projectn/projecta` directory does not exist, it is created.

Command: `restore "/home/devel/projecta/*.c" /home/newdevel/projectn/`

Task Restore all files in the `/home/mydir` directory to their state as of 1:00 PM on August 17, 2002.

Command: `res -pitd=8/17/2002 -pitt=13:00:00 /home/mydir/`

Task Restore all objects in the `/home/myid/` directory. Since this restore is fully wildcarded, if the restore process is interrupted, a restartable restore session is created. Use the **restart restore** command to restart a restartable restore session. Use the **cancel restore** command to cancel a restartable restore session.

Command: `res /home/myid/*`

Task Restore files specified in the filelist to a different location.

Command: `res -filelist=/home/avi/restorelist.txt /home/NewRestoreLocation/`

Restore Backupset

The **restore backupset** command restores a backup set from the server, a local file, or a local tape device.

If you are restoring a file space from a backup set to a system that did not perform the original backup, you may need to:
- Specify a destination
- Use the syntax below to specify the source file
- Do both of the above

```
dsmc restore backupset backupsetname {/fsname}/* /destfs/ -subdir=yes
```

You must be a root user to restore an entire backup set from the server, otherwise only files you own are restored.A backup set can also be restored from a tape device on the AIX, AIX 5L, Solaris, and HP clients. See "Location" on page 254 for more information.

If you are unable to restore a backup set from portable media, check with your Tivoli Storage Manager administrator to ensure that the portable media was created on a device using a compatible format.

Note: There is no support in the API for the backup set format. Therefore, backup set data that was backed up via the API cannot be restored or used.

Attention: If the object you want to restore is part of a backup set generated on a node, and the node name is changed on the server, any backup set objects that were generated prior to the name change will not match the new node name. Ensure that the node name is the same as the node for which the backup set was generated.

Restoring Backup Sets in a SAN Environment

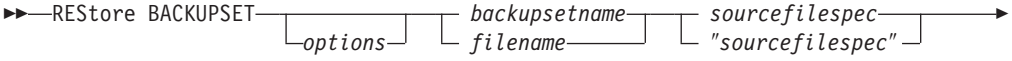
You can restore backup sets in a storage area network (SAN) in the following ways:
- If the backup set is on a SAN-attached storage device, specify the device using the *filename* parameter and use the ***location***=*tape* option. Tivoli Storage Manager restores the backup set directly from the SAN-attached storage device, gaining high-speed restore performance.

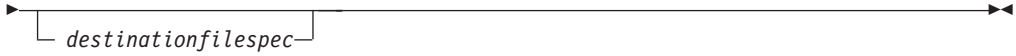
  Note: You must ensure that the correct tape is mounted in the SAN-attached tape drive prior to issuing the **restore** command. The backup-archive client will not initiate a SCSI autochanger to mount the tape automatically.
- If the backup set is not on local media or a SAN-attached storage device, you can specify the backup set using the *backupsetname* parameter. Use the ***location***=*server* option to restore the backup set directly from the server via the LAN.

Supported Clients

This command is valid for all UNIX clients.

Syntax





Parameters

options
You can use these command line options with the **restore backupset** command: ***location***, ***ifnewer***, ***preservepath***. See Chapter 10, "Using Options with Commands" on page 231 for information about these command line options.

You can use these common options with the **restore backupset** command: ***quiet***, ***replace***, ***subdir***. See Chapter 9, "Setting Processing Options" on page 107 for information about these common options.

backupsetname
Specifies the name of the backup set on the server from which to perform a restore operation. You cannot use wildcard characters to specify the backup set name. Tivoli Storage Manager restores the backup set from the server via LAN.

filename
Specifies the name of a local file or device from which to perform a restore operation.

sourcefilespec
Specifies the source path which can be a portion of the backup set. The default is to restore the entire backup set.

destinationfilespec
Specifies the destination path for the restored files. If you do not specify a *sourcefilespec*, you cannot specify a *destinationfilespec*. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path. If you are restoring more than one file, you must end the specification with a directory delimiter (/), otherwise, Tivoli Storage Manager assumes the last name is a file name and reports an error. If you are restoring a single file, you can optionally end the specification with a file name if you want to give the restored file a new name.

Examples

Task Restore a backup set called `mybackupsetname` from the server.

Command:
```
dsmc restore backupset mybackupsetname -loc=server
```

Task Restore the backup set contained in the `backupsetfile.name` file in the `budget` directory.

Command:
```
dsmc restore backupset "/home/budget/backupsetfile.name"
-loc=file
```

Task Restore a backup set from the `/dev/rmt0` device.

Command:
```
dsmc restore backupset "/dev/rmt0" -loc=tape
```

Task Restore a single file named `budget.dev` from the `/dev/rmt0` device, to the original source path.

Command:
```
dsmc restore backupset /dev/rmt0 "/home/jones/budget.dev"
-loc=tape
```

Task Restore all files in the budget directory that contain a file extension of .txt from the tape(s) on the /dev/rmt0 device, to the original source path.

Command: dsmc restore backupset /dev/rmt0 "/home/budget/*.txt" -loc=tape

Task Restore the backup set **bset01.001** from the server.

Command: dsmc restore backupset bset01.001 -loc=server

Task Restore the backup set contained in local file "/home/jones/bset01.file".

Command: dsmc restore backupset "/home/jones/bset01.file" -loc=file

Restore Image

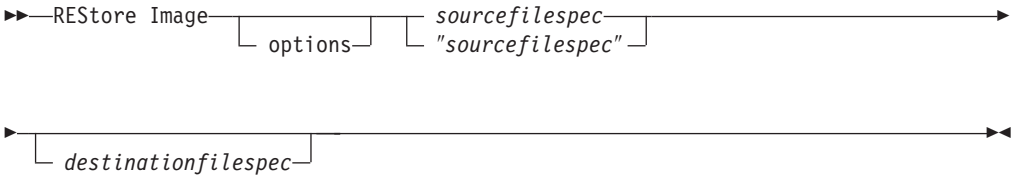
The **restore image** command restores a file system or raw volume image that was backed up using the **backup image** command. This command can restore an active base image, or a point-in-time base image, with associated incremental updates.

Notes:
1. The API must be installed to use the **restore image** command.
2. Image restore of the Sun QFS file system is not supported.

Supported Clients

This command is valid for AIX, HP/UX, Linux86, and Solaris *only*.

Syntax



Parameters

options
You can use these command line options with the **restore image** command: ***deletefiles, fromnode, fromowner, inactive, incremental, noprompt, pick, pitdate***, and ***pittime***. For detailed information about these options, see Chapter 10, "Using Options with Commands" on page 231.

sourcefilespec
Specifies the name of a source image file system to be restored. Only a single source image may be specified; you cannot use wildcard characters.

destinationfilespec
Specifies the name of an existing mounted file system to which the source file system will be restored. The default is the original location of the file system.

The **restore image** command does not define or mount the destination file space. The destination volume must exist, must be large enough to hold the source, and, if it contains a file system, must be mounted. The destination volume must be mapped to a drive letter or mount point. If an image backup contains a file system, and you restore them to a different location, be aware of the following points:

- If the destination volume is smaller than the source volume, the operation will fail.
- If the destination volume is larger than the source, after the restore operation you will *lose* the difference between the sizes. The lost space can be recovered by increasing the size of the volume. This will also increase the size of the restored volume.

Examples

Task Restore the `/home/test` directory over which the logical volume is mounted, to its original location.

Command: `dsmc rest image /home/test`

Task Restore the `/home/proj` directory over which the logical volume is mounted, to its original location and apply the changes from the last incremental backup of the original image recorded at the server. The changes include deletion of files.

Command: `dsmc restore image /home/proj -incremental -deletefiles`

Restore NAS

The **restore nas** command restores the image of a file system belonging to a Network Attached Storage (NAS) file server. The NAS file server performs the outboard data movement. A server process performs the restore.

Use the ***nasnodename*** option to specify the node name for the NAS file server. When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID. The NAS node name identifies the NAS file server to the Tivoli Storage Manager server. You must register the NAS node name at the server. Place the ***nasnodename*** option in your client system options file `dsm.sys`. The value in the client system options file is the default, but this value can be overridden on the command line. See "Nasnodename" on page 178 for more information.

You can use the ***pick*** option to display a list of NAS images owned by the NAS node you specify. From this list you can select one or more images to restore. If you select multiple images to restore using the ***pick*** option, do not use the ***monitor*** option or you will serialize the restores. To start multiple restore processes simultaneously when restoring multiple images, do not specify ***monitor***=*yes*.

Use the ***monitor*** option to specify whether you want to monitor a NAS file system image restore and display processing information on your screen. See "Monitor" on page 256.

Use the **monitor process** command to display a list of current restore processes for all NAS nodes for which your administrative user ID has authority. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.

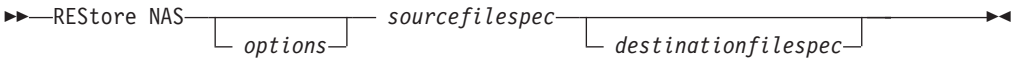
Use the **cancel process** command to stop NAS restore processing. For more information, see "Cancel Process" on page 285.

Regardless of client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.

Supported Clients

This command is valid for AIX, AIX 5L, and Solaris clients *only*.

Syntax



Parameters

options
You can use these common options with the **restore nas** command: ***nasnodename***, ***quiet***, ***verbose***. For more information, see Chapter 9, "Setting Processing Options" on page 107.

You can use these command line options with the **restore nas** command: ***inactive***, ***monitor***, ***pick***, ***pitdate***, ***pittime***. For more information, seeChapter 10, "Using Options with Commands" on page 231.

sourcefilespec
Specifies the name of the NAS file system image you want to restore. This parameter is required unless you use the ***pick*** option to display a list of NAS images from which to choose. You cannot use wildcard characters when specifying the *sourcefilespec*.

destinationfilespec
Specifies the name of an existing mounted file system on the NAS device over which you want to restore the image. This parameter is optional. The default is the original location of the file system on the NAS device.

Examples

Task Restore the NAS file system image `/vol/vol1` to the `/vol/vol2` file system on the NAS file server called **nas1**.

Command: `restore nas -nasnodename=nas1 /vol/vol1 /vol/vol2`

Task Restore inactive NAS images.

Command: `restore nas -nasnodename=nas2 -pick -inactive`

Retrieve

The **retrieve** command obtains copies of archived files from the Tivoli Storage Manager server. You can retrieve specific files or entire directories. Use the ***description*** option to specify the descriptions assigned to the files you want to retrieve.

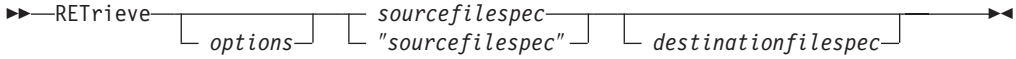
You can also use the ***pick*** option to display a list of your archives. From this list, you can select an archive to retrieve.

Retrieve the files into the same directory from which they were archived, or in a different directory. Tivoli Storage Manager uses the *preservepath* option with the *subtree* value as the default for restoring files. For more information, see Chapter 10, "Using Options with Commands" on page 231.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options
You can use these command line options with the **retrieve** command: ***description, dirsonly, filelist, filesonly, fromdate, fromnode, fromowner, fromtime, ifnewer, pick, preservepath, todate, totime***. For more information, see Chapter 10, "Using Options with Commands" on page 231.

sourcefilespec
Specifies the path and file name that you want to retrieve. Use wildcard characters to specify a group of files or all the files in a directory. See "Maximum File Size for Operations" on page 275 for the maximum file size for retrieve processing.

destinationfilespec
Specifies the path and file name where you want to retrieve the files to. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path.

Examples

Task Retrieve a single file named `budget`.

Command: `retrieve /home/devel/projecta/budget`

Task Retrieve all files with an extension of `.c` from the `/home/devel/projecta` directory.

Command: `retrieve "/home/devel/projecta/*.c"`

Task Retrieve all files in the `/home` directory.

Command: `retrieve /home/`

Task Retrieve all files with a file extension of `.c` from the `/home/devel/projecta`

directory to the /home/newdevel/projectn/projecta directory. If the /projectn or the /projectn/projecta directory does not exist, it is created.

Command: `retrieve "/home/devel/projecta/*.c" /home/newdevel/projectn/`

Task Retrieve files in the /user/project directory. Use the ***pick*** option.

Command: `ret "/user/project/*" -pick`

Task Retrieve all files archived from the /proj directory with the description ″2002 survey results.″

Command: `retrieve "/proj/*" -desc="2002 survey results"`

Task Retrieve archived file /home/devel/budget with description ″my budget″ to the /dev/rmt1 tape drive.

Command:

```
mkfifo fifo
dd if=fifo of=/dev/rmt1&
dsmc retrieve -replace=yes -description="mybudget"
/home/devel/budget fifo
```

Schedule

Authorized User

The **schedule** command starts the client scheduler on your workstation. The client scheduler must be running before scheduled work can start.

If the ***schedmode*** option is set to polling, when you start the client scheduler it continuously contacts the server for scheduled events based on the time you specified with the ***queryschedperiod*** option in your client user options file `dsm.opt`. If your administrator sets the ***queryschedperiod*** option for all nodes, that setting overrides your setting.

If you are using TCP/IP communications, the server can prompt your workstation when it is time to run a scheduled event. To do so, set the ***schedmode*** option to *prompted* in the client user options file `dsm.opt` or on the **schedule** command.

Note: Tivoli Storage Manager does not support the client scheduler running in *prompted* mode across a firewall. Use the client scheduler in *polling* mode across a firewall.

After you start the client scheduler, it continues to run and to start scheduled events until you press Ctrl+C, stop the scheduler process with the UNIX **kill** command, start the workstation again, or turn off the workstation to end it.

Note: You *cannot* enter this command in interactive mode.

Supported Clients

This command is valid for all UNIX clients.

Syntax

Parameters

options
You can use these common options: ***maxcmdretries***, ***password***, ***queryschedperiod***, ***retryperiod***, ***schedlogname***, ***schedmode***, and ***tcpclientport***. See Chapter 9, "Setting Processing Options" on page 107 for more information.

Examples

Task For AIX, AIX 5L: Start the scheduler at system bootup time by entering this command in the **/etc/inittab** file. Ensure the ***passwordaccess*** option is set to *generate*.

Command:
```
tsm::once:/usr/lpp/adsm/bin/dsmc sched > /dev/null 2>&1
#TSM Scheduler
```

Task Interactively start the scheduler and keep it running in the background.

Command:
```
nohup dsmc sched 2> /dev/null &
```

When you run the **schedule** command, all messages regarding scheduled work are sent to a file called `dsmsched.log` or to an alternate file you specify with the ***schedlogname*** option in your client user options file `dsm.opt`. If you do not specify a directory path with the file name in the ***schedlogname*** option, the `dsmsched.log` file will reside in the default installation directory.

Selective

The **selective** command backs up files that you specify. If these files become damaged or lost, you can replace them with backup versions from the server. When you run a selective backup, all the files are candidates for back up unless they are excluded from backup in your include-exclude list, or they do not meet management class requirements for serialization.

During a selective backup, copies of the files are sent to the server even if they did not change since the last backup. This might result in more than one copy of the same file on the server. If this occurs, you might not have as many different down-level versions of the file on the server as you intended. Your version limit might consist of identical files. To avoid this, use the **incremental** command to back up only new and changed files.

You can selectively back up single files *or* directories. You can also use wildcard characters to back up groups of related files.

If you set the ***subdir*** option to *yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

During a selective backup, a directory path may be backed up, even if the specific file that was targeted for backup is not found. For example:

```
selective "/dir1/dir2/bogus.txt"
```

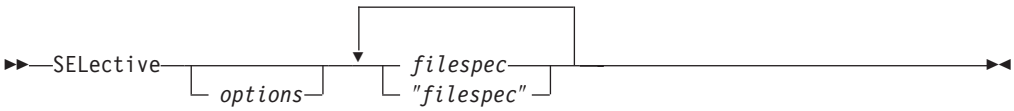
still backs up dir1 and dir2 even if the file `bogus.txt` does not exist.

If the **selective** command is retried because of a communication failure or session loss, the transfer statistics will display the number of bytes Tivoli Storage Manager attempts to transfer during *all* command attempts. Therefore, the statistics for bytes transferred may not match the file statistics, such as those for file size.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

options

You can use these command line options with the **selective** command: ***changingretries, dirsonly, filesonly, volinformation, filelist, tapeprompt, subdir***. For more information, see Chapter 10, “Using Options with Commands” on page 231.

You can use the ***quiet*** common option with the **selective** command. See Chapter 9, “Setting Processing Options” on page 107 for information about common options.

filespec
Specifies the path and file name that you want to back up. Use wildcard characters to select a group of files or all the files in a directory. You can enter up to 20 file specifications in a command, separating the file specifications with a space. When backing up a file system, specify the file system with a trailing slash; for example: `/home/`.

Examples

Task Back up the `proja` file in the `/home/devel` directory.

Command: `selective /home/devel/proja`

Task Back up all files in the `/home/devel` directory whose file names begin with `proj`.

Command: `selective "/home/devel/proj*"`

Task Back up all files in the `/home/devel` directory whose file names begin with `proj`. Back up the single file named `budget` in the `/user/home` directory.

Command: `selective "/home/devel/proj*" /user/home/budget`

Task Back up the `/home` file system.

Command: `selective /home/`

Set Access

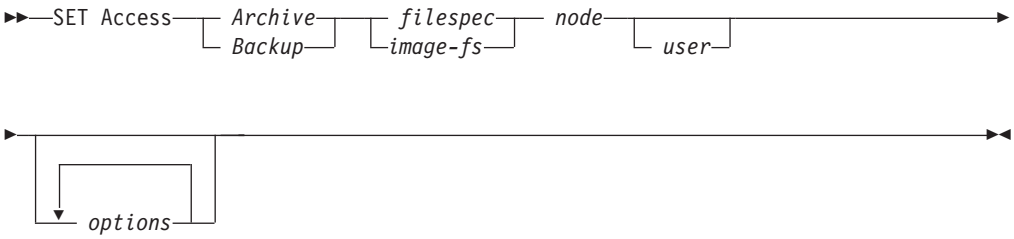
The **set access** command gives users at other nodes access to your backup versions, archived copies, or backup images. You can give another user access to a specific file or image, multiple files or images, or all files or images in a directory. When you give access to another user, that user can restore or retrieve your objects. Specify in the command whether you are giving access to archives or backups.

Note: You cannot give access to both archives and backups using a single command.

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

Archive
Permits access to archived files or images.

Backup
Permits access to backup versions of files or images.

filespec
Specifies the path, file, image, or directory to which your are giving access to another node or user. Use wildcard characters to specify a group of files or images, or all files and images in a directory; all objects in a directory branch; or all objects in a file system. Use a single asterisk "*" for the file spec to give access to all files or images owned by you and backed up on the server. When the command **set access backup** "*" **node** is entered, no check is made with the server; it is assumed you have at least one object backed up.

If you give access to a branch of the current working directory, you only need to specify the branch. If you give access to objects that are not in a branch of the current working directory, you must specify the complete path. The file spec to which you gave access must have at least one backup version or archive copy object (file or directory) on the server.

To give access to all objects below a certain level, use an asterisk, directory delimiter, and an asterisk at the end of your file spec. For example, to give access to all objects below `home/test`, use file spec `home/test/*/*`.

To specify all files or images in a named directory, enter `home/mine/proj1/*` on the command line. To specify all files or images in all directories off of the root directory, enter `/*/*` on the command line. Enter `/*` on one **set access**

command and /*/* on another if you want another user to have complete access to all of your files. The first /* gives access to all subdirectories and all files or images off of the root directory.

image-fs
The name of the image file system to be shared. This may be specified as an asterisk (*) to allow access to all images owned by the user granting access.

node
Specifies the client node of the user to whom you are giving access. Use wildcards to give access to more than one node with similar node names. Use an asterisk (*) to give access to all nodes.

user
This is an optional parameter that restricts access to the named user at the specified node.

options
See Chapter 9, "Setting Processing Options" on page 107 for information about common options that you can use with this command.

Examples

Task Give the user at node_2 authority to restore the budget file from the /home/user directory.

Command: `set access backup /home/user/budget node_2`

Task Give node_3 authority to retrieve all files in the /home/devel/proja directory whose file names end with .c.

Command: `set access archive "/home/devel/proja/*.c" node_3`

Task Give node_3 the authority to retrieve all files in the /home/devel/proja directory.

Command: `set ac archive /home/devel/proja/ node_3`

Task Give all nodes whose names end with bldgb the authority to restore all backup versions from directories with a file space name of project.

Command: `set ac b "{project}/*" "*bldgb"`

Task Give user serena at node_5 authority to restore all images of the file space mounted on directory /home/devel/proja.

Command: `set acc backup "home/devel/proja/*/*" node_5 serena`

Set Password

Authorized User

The **set password** command changes the Tivoli Storage Manager password for your workstation. If you omit the old and new passwords when you enter the **set password** command, you are prompted once for the old password and twice for the new password.

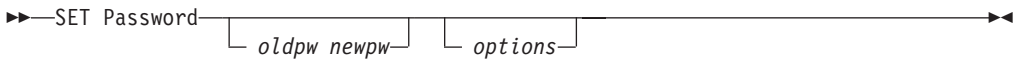
A password is *not* case-sensitive, and it can be as many as 63 characters. Valid characters are:

a–z Any letter, a through z, upper or lower-case
0–9 Any number, 0 through 9
+ Plus
. Period
_ Underscore
- Hyphen
& Ampersand

Supported Clients

This command is valid for all UNIX clients.

Syntax



Parameters

oldpw
Specifies the current password for your workstation.

newpw
Specifies the new password for your workstation.

options
Select any valid common option. For more information, see Chapter 9, "Setting Processing Options" on page 107.

Examples

The following is an example of using the **set password** command.

Task Change your password from `osecret` to `nsecret`.

Command: `set password osecret nsecret`

Appendix A. The AFS and DFS File Backup Clients

There are three pair of AIX file backup clients for the GUI and the command line. Runtime requirements for the AFS/DFS file backup clients include conditions for the following:
- Presence of the AFS or DFS kernel extension.
- Product licensing.

The AFS and DFS file backup GUI and command line clients back up, restore, archive, and retrieve:
- AFS/DFS files.
- Directories.
- Access control lists (ACLs).

In addition, backup clients recognize AFS/DFS mount points.

Note: The AFS/DFS versions of Tivoli Storage Manager executable files are available for AIX *only*.

Contrasting AIX File Backup Clients

The current AIX AFS and DFS file backup clients (dsmafs, dsmcafs, dsmdfs, and dsmcdfs) include **dsm** and **dsmc** functions that are not available in AIX clients. See the table, Table 38, for a summary of the differences.

Table 38. Differences Between AIX File Backup Clients

AIX clients	What they can do
dsm, dsmc	Back up and archive AFS and DFS files and directories.
dsmafs, dsmcafs	Back up and archive AFS directories, files, and ACLs. In addition, they back up mount points.
dsmdfs, dsmcdfs	Back up and archive DFS directories, files, and ACLs. In addition, they back up mount points.

Select Backup Functions

The commands below contain current AFS and DFS file backup functions.

Command	Function
`/usr/tivoli/tsm/client/ba/bin/dsmafs`	Starts a GUI session with the current AFS support.
`/usr/tivoli/tsm/client/ba/bin/dsmcafs`	Starts a command line session with the current AFS support.
`/usr/tivoli/tsm/client/ba/bin/dsmdfs`	Starts a GUI session with the current DFS support.
`/usr/tivoli/tsm/client/ba/bin/dsmcdfs`	Starts a command line session with the current DFS support.

If you want all users to select the same Tivoli Storage Manager backup clients with the current AFS or DFS support, perform the following steps:
1. Delete or rename **dsm** and **dsmc**.
2. Rename **dsmafs** or **dsmdfs** and **dsmcafs** or **dsmcdfs** to **dsm** and **dsmc**.

© Copyright IBM Corp. 1993, 2002

Then, you can enter **dsm** to start a GUI session or **dsmc** to start a command line session with the current AFS or DFS support.

Set the Exclude.fs Option

You may specify that you do not want to back up an entire AFS or DFS directory tree that begins with `/afs` or `/dfs`. For AFS, enter `exclude.fs /afs` in a file specified by the ***inclexcl*** option. For DFS, enter `exclude.fs /dfs` in a file specified by the **dfsinclexcl** option. This prevents the directory from appearing in the backup-archive list and from being included in incremental backups.

For more information about the ***exclude.fs*** option, see "Creating an Include-Exclude List (Optional)" on page 29 and "Exclude Options" on page 152.

Understanding Potential Backup Problems Caused by Mount Points

Mount points are UNIX symbolic links with special syntax. They can cause problems for a backup program that crosses the tree formed with these mount points. For example, user `foo` creates an AFS mount point for the `user.foo` volume in his home directory. User `foo` also forms a cycle in the directory tree. The backup program enters an infinite loop that looks like this:

```
/afs/xyz-cell/u/foo
/afs/xyz-cell/u/foo/foo
/afs/xyz-cell/u/foo/foo/foo
⋮
```

User `foo` can also create a mount point for a root volume of a foreign cell. This expands the subdirectory of user `foo` to include a tree that would be unimportant to back up.

With DFS, you can create loops by adding DFS fileset mount points in different ways. You also can create a mount point for a root fileset of a foreign cell. This action expands your subdirectory to include a large tree that would be unimportant to back up.

With AFS, you can add volume mount points in any directory where you have write access. The command for performing this task is the AFS **fs mkmount** command.

With DFS, you can add fileset mount points in any directory where you have write access. The command for performing this task is the DFS **fts crmount** command.

The following options address these problems:

- ***afsbackupmntpnt***
- ***dfsbackupmntpnt***
- ***virtualmountpoint***
- ***domain***

The Afsbackupmntpnt Option

By default, Tivoli Storage Manager AFS file backup clients do not cross AFS mount points. AFS mount points and symbolic links require similar backups. For example, if you define `/afs/xyz-cell/u/foo` as a Tivoli Storage Manager virtual mount point and enter this command:

```
incremental /afs/xyz-cell/u/foo
```

Tivoli Storage Manager performs the following incremental backup for `/foo:`

1. Backs up any files under `/foo:` that are eligible for backup.
2. Backs up directories under `/foo:` that are not AFS mount points.
3. Backs up mount point information for any AFS mount point under `/foo:`.

Note: Tivoli Storage Manager does *not* process files or subdirectories under any AFS mount point encountered under `/foo:`. Processing stops at each mount point.

If you want the file backup clients to cross AFS mount points, set the ***afsbackupmntpnt*** option to *no*. Tivoli Storage Manager backs up the mount point *as a directory* rather than as a symbolic link to the target volume. For more information about the ***afsbackupmntpnt*** option, see "Afsbackupmntpnt" on page 122.

When you use the archive client, the directory that is pointed to by the mount point is archived.

The Dfsbackupmntpnt Option

By default, Tivoli Storage Manager DFS file backup clients do not cross DFS mount points. The DFS mount points and symbolic links require similar backups. For example, if you define `/.../xyz-cell/fs/u/foo` as a Tivoli Storage Manager virtual mount point and you enter this command:

```
incremental /.../xyz-cell/fs/u/foo
```

Tivoli Storage Manager performs the following incremental backup for `/foo:`

1. Backs up any files under `/foo` that are eligible for backup.
2. Backs up directories under `/foo` that are not DFS mount points.
3. Backs up mount point information for any DFS mount point under`/foo`.

Note: Tivoli Storage Manager does not process files or subdirectories under any DFS mount point it encounters under `/foo`. Processing stops at each mount point.

If you want the file backup clients to cross DFS mount points, set the ***dfsbackupmntpnt*** option to *no*. Tivoli Storage Manager backs up the mount point as a directory rather than as a symbolic link to the target fileset. For more information about the ***dfsbackupmntpnt*** option, see "Dfsbackupmntpnt" on page 136.

When you use the archive client, the directory that is pointed to by the mount point is archived.

Set the Virtualmountpoint and Domain Options

Use the ***exclude.fs*** option to exclude `/afs` or `/...` as a file space. Add Tivoli Storage Manager virtual mount point definitions in your client system options (dsm.sys) file for the portions of AFS or DFS that you want to back up.

Specify a Tivoli Storage Manager virtual mount point for every AFS volume or DFS fileset that you want to back up. Set ***afsbackupmntpnt*** to *yes* (the default) or ***dfsbackupmntpnt*** to *yes* (the default). For example, to schedule incremental backups of *all* AFS volumes, define a virtual mount point for each directory that begins a user volume. See the example below.

```
virtualmountpoint /afs/sanjose.ibm.com/u/alice
virtualmountpoint /afs/sanjose.ibm.com/u/bob
virtualmountpoint /afs/sanjose.ibm.com/u/charlie
```

To schedule incremental backups of *all* DFS volumes, define a virtual mount point for each directory that begins a user volume. See the example below.

```
virtualmountpoint /.../sanjose.ibm.com/fs/u/alice
virtualmountpoint /.../sanjose.ibm.com/fs/u/bob
virtualmountpoint /.../sanjose.ibm.com/fs/u/charlie
```

Set corresponding ***domain*** options in your client user options (dsm.opt) file to include the virtual mount points in your default client domain. See the example below.

```
domain /afs/sanjose.ibm.com/u/alice
domain /afs/sanjose.ibm.com/u/bob
domain /afs/sanjose.ibm.com/u/charlie
```

You can then schedule a daily incremental backup using the **dsmcafs incremental** or **dsmcdfs incremental** command through a crontab job (or any other scheduling tool).

For more information about the ***virtualmountpoint*** option, see "Virtualmountpoint" on page 225. For more information about the ***domain*** option, see "Domain" on page 139.

Use Another Method to Set These Options

You can set the ***virtualmountpoint*** and ***domain*** options without specifying all the AFS volume mount points or all the DFS fileset mount points. For example, rather than listing all AFS or DFS user home directories, specify their parent directory (`/afs/sanjose.ibm.com/u` or `/.../sanjose.ibm.com/fs/u`) as a virtual mount point. See the examples below. **For AFS:**

```
virtualmountpoint /afs/sanjose.ibm.com/u
```

Set the ***afsbackupmntpnt*** option to *no*. The client program crosses the AFS volume mount points in the `/afs/sanjose.ibm.com/u` directory, then backs up all the mounted AFS user volumes. For example, enter the following line in the client system options file:

```
afsbackupmntpnt no
```

Attention: Use this AFS setup with caution because it backs up all volumes mounted below `/afs/sanjose.ibm.com/u`. When you create AFS mount points, you expose the backup operation to potential cyclic mount points. If you link to the root of a foreign AFS cell, you also expose the backup operation to potential mount points.

For DFS:

```
virtualmountpoint /.../sanjose.ibm.com/fs/u
```

Set the ***dfsbackupmntpnt*** option to *no*. The client program crosses the DFS fileset mount points in the `/.../sanjose.ibm.com/fs/u` directory. The client program then backs up all the mounted DFS user filesets. For example, enter the following line in the client system options file:

```
dfsbackupmntpnt no
```

Attention: Use this DFS setup with caution because it backs up all filesets mounted below `/.../sanjose.ibm.com/fs/u`. When you create AFS mount points, you expose the backup operation to potential cyclic mount points. If you link to the root of a foreign DFS cell, you also expose the backup operation to potential mount points.

You can set ***domain*** options in your client user options file to include the virtual mount point in your default client domain. See the examples below.

For AFS:

```
domain /afs/sanjose.ibm.com/u
```

For DFS:

```
domain /.../sanjose.ibm.com/fs/u/alice
domain /.../sanjose.ibm.com/fs/u/bob
domain /.../sanjose.ibm.com/fs/u/charlie
```

You can then schedule a daily incremental backup using the **dsmcafs incremental** or **dsmcdfs incremental** command through a crontab job (or any other scheduling tool).

Setting the ACLs and Kerberos Login

Ensure that the **dsmcafs** program has the read and list (rl) permissions on all directories that you must back up. If you want the backup program to access the files, set up the directory ACLs correctly.

Use the AFS administrator identity to back up any AFS directory.

Setting the ACLs and DCE Login

Ensure that the **dsmcdfs** program has the read and list (rl) permissions on all directories and the read (r) permission on all files. To access files, set up the directory and file ACLs correctly.

An AIX user can log on as the DCE root principal to back up any DFS directory and file.

Restoring AFS or DFS Files

Ensure that you have ACL access to the AFS or DFS destination directories and files where you want to restore the data.

Setting Processing Options

This section provides information about AFS/DFS options for AFS/DFS file backup clients. The table below lists the processing options and their function.

Table 39. Processing Options

Option	Function
afsbackupmntpnt	Specifies whether you want Tivoli Storage Manager to see an AFS mount point as a mount point or as a directory.
dfsbackupmntpnt	Specifies whether you want Tivoli Storage Manager to see a DFS mount point as a mount point or as a directory.
dfsinclexcl	Specifies the path and file name of your DFS include-exclude options file. **Note:** AFS uses the regular ***inclexcl*** options file.
domain	Specifies the file systems you want to include in your client domain for incremental backup.

Table 39. Processing Options (continued)

Option	Function
exclude	Excludes files, directories, and file systems from backup services.
virtualmountpoint	Defines a virtual mount point for a file system if you want backup beginning with a specific directory within that file system.

Appendix B. Configuring the Backup-Archive Client in an HACMP Takeover Environment

High Availability Cluster Multi Processing (HACMP) allows scheduled Tivoli Storage Manager client operations to continue processing during a failover situation.

For example, a scheduled incremental backup of a clustered volume is running on **machine-a**. A situation causes the CAD to failover to **machine-b**. **machine-b** then reconnects to the server. If the reconnection occurs within the start window for that event, the scheduled command is restarted. This scheduled incremental backup will reexamine files sent to the server before the failover. The backup will then "catch up" to where it terminated before the failover situation.

If a failover occurs during a user initiated client session, the Tivoli Storage Manager client acceptor daemon (CAD) starts on the node that is handling the takeover. This allows it to process scheduled events and provide Web client access. You can install Tivoli Storage Manager locally on each node of an HACMP environment. You can also install and configure the Tivoli Storage Manager Scheduler Service for each cluster node to manage all local disks and each cluster group containing physical disk resources.

The ***clusternode*** option determines if you want the Tivoli Storage Manager client to back up cluster resources and participate in cluster failover for high availability. See "Clusternode" on page 126 for more information.

The following software is required:

- HACMP for AIX Version 4.4 (or later) or HACMP/ES for AIX Version 4.4 (or later)
- AIX 4.3.3 (or later)

The HACMP Cluster Information Daemon must also be running.

Installing the Backup-Archive Client

Install the Tivoli Storage Manager Backup-Archive client software on a local disk on each node in the cluster you want to participate in an HACMP takeover. The following client configuration files must be stored locally:

- The client executables and related files should reside in the same location on each node in the cluster.
- The API executable and configuration files should reside in the default API installation directory (`/usr/tivoli/tsm/client/api/bin`)
- The system options file (`dsm.sys`) should reside in the default client installation directory (`/usr/tivoli/tsm/client/ba/bin`)

The following client configuration files must be stored externally in a shared disk subsystem so they can be defined as a cluster resource and be available to the takeover node during a failover. Each resource group must have the following configuration:

- The client option file (`dsm.opt`), include-exclude file, and password file must be placed in a directory on the shared disk.

© Copyright IBM Corp. 1993, 2002

- The client error log file must be placed on the shared disk volumes to maintain a single continuous error log file.

Configuring the Backup-Archive Client To Process Local Nodes

You can edit your `dsm.opt` file on each local node to process local disk drives using the following options:

clusternode
Do not specify this option when processing local drives. See "Clusternode" on page 126 for more information.

nodename
If no value is specified, Tivoli Storage Manager uses the local machine name. See "Nodename" on page 180 for more information.

domain
If no value is specified, Tivoli Storage Manager processes all local drives that are not owned by the cluster. See "Domain" on page 139 for more information.

You can also configure the Tivoli Storage Manager Backup-Archive Scheduler Service to back up the local cluster nodes.

Configuring Tivoli Storage Manager Backup-Archive Client To Process Cluster Disk Resources

Ensure that Tivoli Storage Manager manages each cluster group that contains physical disk resources as a unique node. This ensures that Tivoli Storage Manager correctly manages all disk resources, regardless of which cluster node owns the resource at the time of back up.

Step 1: Register the Client to a Server

A Tivoli Storage Manager client in an HACMP cluster must be registered to a Tivoli Storage Manager server with an assigned node name. Consider the following conditions when registering your node name:

- If local volumes that are *not* defined as cluster resources will be backed up, separate node names (and separate client instances) must be used for both non-clustered and clustered volumes.
- The node name used to back up clustered volumes defaults to the cluster name, not the host name. We recommend that you choose a node name related to the cluster resource group to be managed by that node.
- If multiple resource groups are defined in the HACMP environment to failover independently, then separate node names must be defined per resource group.

Step 2: Configure the Client System Options File

Each node in the HACMP cluster that runs the Tivoli Storage Manager client must have the following settings defined in each respective `dsm.sys` file:

- Separate server stanzas to back up non-clustered volumes
- Separate server stanzas for each cluster resource group to be backed up

The server stanzas defined to back up non-clustered volumes must have the following special characteristics:

- The value of the ***tcpclientaddress*** option must be the *service* IP address. This is the IP address used for primary traffic to and from the node.

- If the client will back up and restore non-clustered volumes without being connected to the HACMP cluster, the value of the ***tcpclientaddress*** option must be the *boot* IP address. This is the IP address used to start the machine (node) before it rejoins the HACMP cluster.

The server stanzas defined to back up clustered volumes must have the following special characteristics:

- ***clusternode*** *yes*
- The ***nodename*** value must be related to the resource group. If ***nodename*** is not specified, the cluster name is used.
- The ***tcpclientaddress*** option must refer to the service IP address of the HACMP node.
- The ***passworddir*** option must point to a directory on the shared volumes that are part of the cluster resource group.
- The ***errorlogname*** and ***schedlogname*** options must point to files on the shared volumes that are part of the cluster resource group.
- All ***inclexcl*** statements must point to files on the shared volumes that are part of the cluster resource group.
- Set the ***manageservices*** statement to indicate that the scheduler (or web client) should be managed by the client acceptor daemon.

Other options can be set as desired.

Step 3: Configure the Client User Options File

The client user options file (`dsm.opt`) for the Tivoli Storage Manager client that will manage your clustered file spaces must reside on the shared volumes in the cluster resource group. Define the DSM_CONFIG environment variable to point to this `dsm.opt` file. Make sure the `dsm.opt` file contains the following settings:

- The value of the ***servername*** option must be the server stanza in the `dsm.sys` file which defines parameters for backing up clustered volumes. The `dsm.sys` file may reside on shared space.
- If the `dsm.sys` file resides on a local disk, each node on the cluster must have a matching stanza.
- Define clustered filespaces to be backed up with the ***domain*** option.
- Other options can be set as desired.

Defining the Client as an HACMP Application

The Tivoli Storage Manager client must be defined as an application to HACMP to participate in failover processing. See *HACMP for AIX 4.4.1 Installation Guide*, SC23-4278, for detailed instructions on how to perform this procedure. Following is a summary of this procedure:

1. Start HACMP for AIX system management with the following command:

   ```
   smit hacmp
   ```

2. Select **Cluster Configuration**, **Cluster Resources**, **Define Application Servers**, and **Add an Application Server**.
3. Enter the following field values:

   Server Name
   Enter an ASCII text string that identifies the server. You use this name to refer to the application server when you define it as a resource during node configuration. The server name can include alphabetic and numeric characters and underscores. Use no more than 31 characters.

Start Script

Enter the full path name of the script that starts the server. This script is called by the cluster event scripts and must reside on a local disk. This script must be in the same location on each cluster node that might start the server. The start script is used in the following cases:

a. when HACMP is started and resource groups are activated
b. when a failover occurs and the resource group is started on another node
c. when fallback occurs (a failed node re-enters the cluster) and the resource group is transferred back to the node re-entering the cluster.

A sample start script (StartClusterTsmClient.sh.smp) is provided in the `/usr/tivoli/tsm/client/ba/bin` directory.

Stop Script

Enter the full path name of the script that stops the server. This script is called by the cluster event scripts and must reside on a local disk. This script must be in the same location on each cluster node that might stop the server. The stop script is used in the following cases:

a. when HACMP is stopped
b. when a failover occurs due to a component failure in a resource group, the other members are stopped so that the entire group can be restarted on the target node in the failover
c. when a fallback occurs and the resource group is stopped on the node currently hosting it to allow transfer back to the node re-entering the cluster.

A sample stop script (StopClusterTsmClient.sh.smp) is provided in the `/usr/tivoli/tsm/client/ba/bin` directory.

4. Press Enter to add your information to the HACMP for AIX.
5. Press F10 after the command completes to exit `smit` and return to the command line. Press F3 to perform other configuration tasks.

The Tivoli Storage Manager client must be in a resource group with a *cascading* or *rotating* takeover relationship. The client does not support a concurrent access resource group. See *HACMP for AIX 4.4.1 Planning Guide*, SC23-4277, for additional information regarding HACMP topology and strategy.

Creating an HACMP Resource Group to Add a Client

You must first create an HACMP resource group so you can add the client to it. The following is a summary of this procedure:

1. Start HACMP for AIX system management with the following command:

   ```
   smit hacmp
   ```

2. Select **Cluster Configuration**, **Cluster Resources**, **Define Resource Groups**, and **Add a Resource Group**. The Add a Resource Group window is displayed.
3. On the Add a Resource Group window, enter the following field values:

   Resource Group Name

   Enter an ASCII text string that identifies the resource group. The resource group name can include alphabetic and numeric characters and underscores. Use no more than 31 characters.

Node Relationship
Select **Cascading**.

Participating Node Names/Default Node Priority
Select the node names that are participating in the resource group. Add the nodes in order of priority. The node owner of the resource group should be the first node listed.

4. Click **OK**.
5. Press F10 to exit `smit` and return to the command line. Press F3 to perform other configuration tasks.

The Tivoli Storage Manager client must be in a resource group with a *cascading* or *rotating* takeover relationship. The client does not support a concurrent access resource group. See *HACMP for AIX 4.4.1 Planning Guide*, SC23-4277, for additional information regarding HACMP topology and strategy.

Adding the Client to an HACMP Resource Group

The Tivoli Storage Manager client must be defined to a cluster resource group. See *HACMP for AIX 4.4.1 Installation Guide*, SC23-4278, for detailed instructions on how to perform this procedure. Following is a summary of how to define resources as part of a resource group:

1. Start HACMP for AIX system management with the following command:
   ```
   smit hacmp
   ```
2. Select **Cluster Configuration**, **Cluster Resources**, and **Change/Show Resources/Attributes for a Resource Group**. Press Enter.
3. Select the desired resource group.
4. Press Enter. The **Configure a Resource Group** screen appears.
5. Enter values that define all the resources you want to add to this resource group.
6. Synchronize cluster resources after entering field values in Step 5. Do this by selecting **Cluster Configuration**, **Cluster Resources**, and **Synchronize Cluster Resources**.
7. Press F10 to exit `smit` and return to the command line. Press F3 to perform other configuration tasks.

The Tivoli Storage Manager client must be added to the resource group that contains the file systems to be backed up. These file systems must also be the same file systems specified by the ***domain*** option in the `dsm.opt` file defined for this client instance.

Both JFS and NFS file systems can be defined as cluster resources. NFS supports only 2 node clusters in a cascading takeover relationship.

Appendix C. Backing Up NAS File Systems Using NDMP

Tivoli Storage Manager supports backup and restore of network attached storage (NAS) file system images to tape drives or libraries that are locally attached to NAS file servers. Data Protection for NDMP enables backup and restore support on the Tivoli Storage Manager Windows NT, 2000, XP, and Windows.NET, AIX, and Solaris servers for NAS file servers from Network Appliance. *Data Protection for NDMP is available only with IBM Tivoli Storage Manager Enterprise Edition..*

For information on how to configure Data Protection for NDMP on the Tivoli Storage Manager server, see the following publications:
- *Tivoli Storage Manager for AIX Administrator's Guide*, GC32-0768
- *Tivoli Storage Manager for Sun Solaris Administrator's Guide*, GC32-0778
- *Tivoli Storage Manager for Windows Administrator's Guide*, GC32-0782

See "Data Protection for NDMP Version 5.1 Requirements (Enterprise Edition only)" on page 2 for client and server hardware and software requirements.

After configuring Data Protection for NDMP, the server connects to the NAS device and uses NDMP to initiate, control, and monitor each backup and restore operation. The NAS device performs outboard data transfer to and from the NAS file system to a locally attached tape drive or library.

It is not necessary for a client node to mount a NAS file system to perform backup or restore operations on that file system.

The benefits of performing backups using Data Protection for NDMP include the following:
- LAN-free data transfer.
- High performance and scalable backups and restores.
- Backup to local tape devices without network traffic.

The following support is provided:
- Full file system image backup of all files within a NAS file system.
- Differential file system image backup of all files that have changed since the last full image backup.
- Parallel backup and restore operations when processing multiple NAS file systems.
- Choice of interfaces to initiate, monitor, or cancel backup and restore operations:
  - Web client
  - Backup-archive command line client
  - Administrative command line client (backup and restore operations can be scheduled using the administrative command scheduler)
  - Administrative Web client

The following functions are *not* supported:
- Archive and retrieve
- Restoring or tracking of individual files within a file system image.
- Client scheduling. Use server commands to schedule a NAS backup.
- Detection of damaged files.
- Data-transfer operations for NAS data stored by Tivoli Storage Manager:
  - Migration
  - Reclamation

© Copyright IBM Corp. 1993, 2002

- Storage pool backup and restore
- Move data
- Export
- Backup set generation

Backing up NAS File Systems using the Web Client GUI

For information on how to install and configure the Web client, see "Installing and Using the Web Client" on page 46.

For both the Web client GUI and the command line client, you must specify ***passwordaccess***=*generate* (which is a current web client restriction for the client node) and the ***authentication***=*on* must be specified at the server. You are always prompted for a user ID and password. To display NAS nodes and perform NAS functions, you must enter an authorized administrative user ID and password. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.

To back up NAS file systems using the Web client GUI:

1. Click **Backup files and directories** from the main window. The Backup window displays.
2. Expand the directory tree if necessary.

   Notes:
   a. The root node called **Nodes** is not selectable. This node only appears if Data Protection for NDMP is enabled on the server.
   b. NAS nodes display on the same level as the client workstation node. Only nodes for which the administrator has authority will display.
   c. NAS nodes are expandable to reveal file spaces, but no further expansion is available (no file names).
3. Click the selection boxes next to the nodes or file systems you want to back up.
4. Click the type of backup you want to perform in the backup type pull-down menu. The NAS backup type list is active only when you first select NAS backup objects.
5. Click **Backup**. The NAS Backup **Task List** window displays the backup processing status and progress bar. The number next to the progress bar indicates the estimated size of the backup, which is the occupancy of the file system. After the backup completes, the NAS Backup Report window displays processing details, including the *actual* size of the backup.

   Note: If it is necessary to close the Web browser session, current NAS operations will continue after disconnect. You can use the **Dismiss** button on the NAS Backup **Task List** window to quit monitoring processing without ending the current operation.
6. (Optional) To monitor processing of an operation from the GUI main window, open the **Actions** menu and select **Monitor TSM Activities**. During a differential backup, the status bar indicates processing status. A percentage estimate does not display.

To restore NAS file system images using the Web client GUI, see "Restoring NAS File Systems" on page 350.

Performing a Command Line Backup

Table 40 lists the commands and options you can use to back up NAS file system images from the command line.

Table 40. NAS Options and Commands

Option or Command	Definition	Page
domain.nas	Specifies the volumes to include in your default domain for NAS backups.	143
exclude.fs.nas	Excludes file systems on the NAS file server from an image backup when used with the **backup nas** command. This option is for AIX, AIX 5L, and Solaris clients *only*.	152
include.fs.nas	Includes a file system or assigns a management class when used with the **backup nas** command. This option is for AIX, AIX 5L, and Solaris clients *only*.	163
query node	Displays all the nodes for which a particular administrative user ID has authority to perform operations. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.	310
backup nas	Creates an image backup of one or more file systems that belong to a Network Attached Storage (NAS) file server.	283
monitor process	Displays current back up and restore processes for all NAS nodes for which an administrative user has authority. The administrative user can then select one process to monitor.	300
cancel process	Displays current back up and restore processes for all NAS nodes for which an administrative user has authority. From the display, the administrative user can select one process to cancel.	285
query backup	Use the **query backup** command with the ***class*** option to display information about file system images backed up for a NAS file server.	303
query filespace	Use the **query filespace** command with the ***class*** option to display a list of file spaces belonging to a NAS node.	306
delete filespace	Use the **delete filespace** with the ***class*** option to display a list of file spaces belonging to a NAS node so that you may choose one to delete.	289

Regardless of client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.

Note: When you initiate a NAS backup operation using the command line client, the server starts a process to initiate, control, and monitor the operation. It may take several moments before you notice progress at the command line client interface because the server must perform mount and other necessary tasks before data movement occurs.

Restoring NAS File Systems

You can restore full or differential NAS file system images that were backed up previously. If you restore a differential image, Tivoli Storage Manager automatically restores the full backup image first, followed by the differential image. It is not necessary for a client node to mount a NAS file system to perform backup or restore operations on that file system.

For information on how to install and configure the Web client, see "Installing and Using the Web Client" on page 46.

To restore NAS file systems using the Web client GUI:

1. Click the **Restore files and directories to your system** from the main window. The Restore window appears.
   - To restore to earlier backup versions of NAS filesystem images select **View →Display active/inactive files** from the main window.
   - To restore NAS file system images to the state that existed at a specific date and time, click the **Point In Time** button on the Restore window and enter the appropriate information.
2. Expand the directory tree if necessary. To expand a node in the tree, click the plus sign (+) next to an object in the tree.

   Notes:
   a. The root node called **Nodes** is not selectable. This node only appears if Tivoli Data Protection for NDMP is enabled on the server.
   b. NAS nodes display on the same level as the client workstation's node. Only nodes to which the administrator has authority appear.
   c. NAS nodes will expand to reveal file systems. Under each file system are images which you can select to restore.
3. Click the selection boxes next to the nodes, file systems or images you want to restore.
4. Click **Restore**. The Restore Destination window appears. Enter the information in the Restore Destination window.

   Note: You can restore NAS file system images to any volume on the NAS file server from which they were backed up. You cannot restore images to another NAS file server.
5. Click **Restore**. The NAS Restore **Task List** window displays the restore processing status and progress bar. The number next to the progress bar indicates the estimated size of the restore. After the restore completes, the NAS Restore Report window displays processing details, including the actual size of the restore.

   Note: If it is necessary to close the Web browser session, current NAS operations will continue after disconnect. You can use the **Dismiss** button on the NAS Restore **Task List** window to quit monitoring processes without ending the current operation.
6. (Optional) To monitor processing of an operation, select the **Actions → Monitor TSM Activities** from the main window.

Table 41 on page 351 lists the commands and options you can use to restore NAS file system images from the command line.

Table 41. NAS Options and Commands

Option or Command	Definition	Page
query node	Displays all the nodes for which a particular administrative user ID has authority to perform operations. The authorized administrative user ID should have at least client owner authority over both the NAS node and the client workstation node they are using either from command line or from the web.	310
query backup	Use the **query backup** command with the ***class*** option to display information about file system images backed up for a NAS file server.	303
query filespace	Use the **query filespace** command with the ***class*** option to display a list of file spaces belonging to a NAS node.	306
restore nas	Restores the image of a file system belonging to a Network Attached Storage (NAS) file server.	323
monitor process	Displays current backup and restore processes for all NAS nodes for which an administrative user has authority. The administrative user can then select one process to monitor.	300
cancel process	Displays current back up and restore processes for all NAS nodes for which an administrative user has authority. From the display, the administrative user can select one process to cancel.	285
delete filespace	Use the **delete filespace** with the ***class*** option to display a list of file spaces belonging to a NAS node so that you may choose one to delete.	289

Regardless of client platform, NAS file system specifications use the forward slash (/) separator, as in this example: `/vol/vol0`.

Note: When you initiate a NAS restore operation using the command line client, the server starts a process to initiate, control, and monitor the operation. It may take several moments before you notice progress at the command line client interface because the server must perform mount and other necessary tasks before data movement occurs. Tivoli Storage Manager may display an `Interrupted ...` message when the mount occurs. You can gnore this message.

Appendix D. Web Client Secure Socket Layer

When administrators sign onto the backup server using the administrative Web interface client, they provide a user ID and password. The backup server generates a security token for this user ID, and this token is used to verify the administrative Web interface each time it issues a command to the server. The security token is encrypted, and expires after a certain period of time. When the administrator, after signing onto the backup server, hyperlinks to the Web backup-archive client, the security token is passed to the Web client and is used to authenticate the user ID. Since this token permits the user access to the client, the Web client provides the user the option to securely pass this information from the administrative Web interface to the Web client using the HTTPS protocol.

HTTPS is simply the HTTP protocol transmitted over a secure socket layer. If your administrators are hyperlinking to client machines to use the Web client, and you need to protect the security token when it is transmitted over the network, then you should configure the Web client for SSL so that the HTTPS protocol can be used.

The following sections contain information that will help you manage SSL communications:
- Configuring SSL Communications
- Configuring Web Client for SSL

To support SSL, the product install package includes utilities to create and maintain certificates. SSL communication is supported on the AIX and AIX 5L clients *only*. You can use the **Make Key File** utility (MKKFE) to create public-private key pairs and certificate requests, receive certificate requests into a key ring, and manage keys in a key ring. MKKFE prompts you for the necessary information. Optionally, after you have created a certificate request, you can send it to a Certificate Authority (CA) to have it signed.

Configuring SSL Communications

This section describes the following tasks for setting up SSL communications for your backups:
- Creating a key pair
- Requesting a certificate
- Receiving the certificate into the key ring

Creating a Key Pair

To create a public-private key pair, request a certificate, receive it into the key ring file, and:
1. Enter **mkkfe** to start the utility.
2. Enter **n** to create a new key ring file. The key ring file is used to store one or more key pairs and certificates.
3. Name the file **certkey.kyr**. The Web client will not recognize any other name.

Requesting a Certificate

To request a certificate:
1. Select **w** from the main menu to work with certificates.

© Copyright IBM Corp. 1993, 2002

2. Select **c** to create a new certificate. Enter **apollo** at the password prompt. This is the password for the key ring file. The Web client does not recognize any other password. After the password is entered twice, a prompt asks if the password will expire; answer **no**.
3. Press **s** to create a PEM certificate. A request for certificate information displays.
4. Press **m** to modify the request for certificate information. You can enter the information requested in each field or leave the field blank by pressing **Enter**.

   Note:
   - When prompted for the key entry name, type **TSM Web Client**.
   - The second entry is for the key size. The recommended key size is 512.
   - When prompted for the server's fully qualified TCP/IP domain name, be sure to enter the TCP/IP domain name where the client is installed.
5. Press **r** to create the certificate request. When prompted for a file name, type: certreq.txt.
6. Press **x** from the Key Menu to return to the Key Ring Menu.

Receiving the Certificate into the Key Ring

To receive the certificate into the key ring:

1. Press **r** from the Key Ring Menu. Enter **certreq.txt** which is the filename of the certificate. If you receive a warning about the certificate being **self-signed**, enter **yes** to add it to the key file.
2. Press **w** to work with the certificate.
3. Press **l** to list and select the certificate. Press **n** to navigate down the list until you find **TSM Web Client**, and press **s** to select it.
4. Press **f** to make the certificate the default certificate. Press **y** when prompted *are you sure you want to make this key the default?*
5. Press **x** to return to the Key Ring Menu.
6. Press **s** to save the Key Ring. You may be prompted if the file already exists; it is OK to overwrite this file.
7. Press **x** to exit MKKFE.

Configuring Web Client for SSL

After the certificate is created and received into the key ring file, copy the key ring file, *certkey.kyr*, to the client installation directory. Before bringing up the **TSM Client Acceptor**, set the ***httpsport*** option. The ***httpsport*** option specifies the TCP/IP port address that is used by the HTTPS secure socket layer (SSL) interface to communicate with the Web client. See "Httpsport" on page 160 for more information.

Set the NLSPATH environment variable as follows:

- **For AIX, AIX 5L**: Export NLSPATH from the shell or add to your **.profile**, for example:

  ```
  export NLSPATH=/usr/tivoli/tsm/client/ba/bin/%N:$NLSPATH
  ```

  Note: This example assumes that you installed the Web client into the `/usr/tivoli/tsm/client/ba/bin` directory. The $NLSPATH setting is used to preserve any previous NLSPATH settings.
- **For Windows**:
  - Open the Windows **Start** menu and select **Settings —> Control Panel**. Then double-click the **System** icon.
  - Select the **Environment** tab and select the NLSPATH system variable.
  - Add the Web client NLSPATH information to the current NLSPATH setting, for example:

```
c:\program files\tivoli\tsm\baclient\%N
```

Note: This example assumes that you installed the Web client into the `c:\program files\tivoli\tsm\baclient` directory.

To start the **TSM Client Acceptor**, follow the procedures in "Starting a Web Client Session" on page 44.

The client starts the initialization of the SSL communication method.

You can access the Web client using the SSL communication method with any browser that is Java 1.3.1-capable by entering the following URL:

```
https://your_machine_name:httpsport_number
```

where your_machine_name is the hostname of the machine running the Web client with the SSL communication method, and httpsport_number is the port number you specified using the ***httpsport*** option, see "Httpsport" on page 160 for more information.

The Web client workstation can also be accessed through the system administrative GUI.

You will receive warning messages from the Web browser the first time you connect to the client machine. This is because the certificate that you created is not trusted by the browser. Each browser handles the matter differently. Netscape permits you to receive the certificate as a Web site certificate. The received certificate is then compared with the certificate sent by the client every time you connect to the server. After setup completes, you are not prompted for more information if you click the **Always accept** bullet in the wizard. Internet Explorer prompts you if the received certificate is not trusted. You will receive this message every time you connect to the client, unless you turn the warning message off.

Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Notices References in this publication to Tivoli Systems or IBM products, programs, or services do not imply that they will be available in all countries in which Tivoli Systems or IBM operates. Any reference to these products, programs, or services is not intended to imply that only Tivoli Systems or IBM products, programs, or services can be used. Subject to valid intellectual property or other legally protectable right of Tivoli Systems or IBM, any functionally equivalent product, program, or service can be used instead of the referenced product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by Tivoli Systems or IBM, are the responsibility of the user. Tivoli Systems or IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

© Copyright IBM Corp. 1993, 2002

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Information Enabling Requests
Dept. M13
5600 Cottle Road
San Jose CA 95193-0001
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Glossary

Term definitions in this glossary pertain to the Tivoli Storage Manager library. If you do not find a term you are looking for, you can refer to the following publications:

- *IBM Dictionary of Computing*, at URL:

  `http://www.ibm.com/networking/nsg/nsgmain.htm`
- *Tivoli Software Glossary*, at URL:

  `http://www.tivoli.com/support/documents/glossary/termsm03.htm`

This glossary may include terms and definitions from:

- The *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright (ANSI). You can purchase copies from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC2/SC1).

A

absolute. A copy group mode value that indicates a file is considered for incremental backup even though the file has not changed since the last time it was backed up. See *mode*. Contrast with *modified*.

access control list (ACL).

1. In computer security, a collection of all access rights for one object.
2. In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights; for example, a list associated with a file that identifies users who can access the file and identifies their access rights to that file.

ACL. access control list

active policy set. The policy set within a policy domain that contains the most recently activated policy. All client nodes assigned to the current policy domain use this policy set. See *policy set*.

active version. The most recent backup copy of a file stored in Tivoli Storage Manager storage for a file that currently exists on a file server or workstation. An active version remains active and exempt from deletion until:
- Replaced by a new backup version.
- Tivoli Storage Manager detects, during an incremental backup, that the user has deleted the original file from a file server or workstation.

administrative client. A program that runs on a file server, workstation, or mainframe. This program lets administrators monitor and control Tivoli Storage Manager servers using administrator commands. Contrast with *backup-archive client*.

administrator. A user who is registered to the server as an administrator. Administrators may possess one or more privilege classes. Administrators can use the administrative client to enter Tivoli Storage Manager server commands and queries according to their privileges.

aggregate data transfer rate. Dividing the total number of bytes transferred by the elapsed processing time calculates the data transfer rate.

archive. A function permitting users to copy one or more files to a long-term storage device. Archive copies can:
- Carry associated descriptive information
- Be compressed to minimize storage requirements
- Be retrieved by archive date, file name, or description

© Copyright IBM Corp. 1993, 2002

Contrast with *retrieve*.

archive copy. A file or group of files residing in an archive storage pool in Tivoli Storage Manager storage.

archive copy group. A policy object containing attributes that control the generation, destination, and expiration of archived files. The archive copy group belongs to a management class.

archive retention grace period. The number of days Tivoli Storage Manager retains an archived copy when the server is unable to rebind the file to an appropriate management class.

authentication. The process of checking and authorizing a user's password before permitting user access to the Tivoli Storage Manager server. An administrator with system privilege can enable or disable authentication.

authorization rule. A specification permitting another user to either restore or retrieve a user's files from Tivoli Storage Manager storage.

Authorized User. A user who has administrative authority for the Tivoli Storage Manager client on a workstation. This user changes passwords, performs open registrations, and deletes file spaces. An Authorized User is any user running with a real user ID of 0 (root) or a user who owns an executable whose owner execution permission bit is set to **s**. In the following example, the user **tivoli** is an Authorized User while running `dsmc` since the `dsmc` owner execution permission bit is set to **s**:

```
-rwsr-xr-x  1  tivoli  dsmdev  2880479  Nov  5 13:42  dsmc*
```

automounted file system (AutoFS). A file system managed by an automounter daemon. The automounter daemon monitors a specified directory path and automatically mounts the file system to access data.

B

backup. A function permitting users to copy one or more files to a storage pool to protect against data loss. Contrast with *restore*.

backup-archive client. A program that runs on a file server, PC, or workstation and provides a means for users to back up, archive, restore, and retrieve files. Contrast with *administrative client*.

backup copy group. A policy object that contains attributes controlling the generation, destination, and expiration of backup files. The backup copy group belongs to a management class.

backup retention grace period. The number of days Tivoli Storage Manager retains a backup version when the server is unable to rebind the file to an appropriate management class.

backup version. A backed up file, directory, or file space that resides in a backup storage pool in Tivoli Storage Manager storage. The *active* version is the most recent backup version. See *active version* and *inactive version*.

binding. The process of associating a file with a management class name.

boot. To prepare a computer system for operation by loading an operating system.

C

central scheduling. A function permitting an administrator to schedule backup and archive operations from a central location. Schedule operations on a periodic basis or on an explicit date.

client. A program running on a file server, PC, workstation, or terminal that requests services of another program called the server. There are two types of Tivoli Storage Manager clients: administrative and backup-archive. See *administrative client* and *backup-archive client*.

client domain. The set of drives, file systems, or volumes selected by a user for processing during a backup or archive operation.

client node. A file server or workstation registered with the server on which the backup-archive client program is installed.

client polling. A client and server communication technique where the client node queries the server for scheduled work.

client/server. A communications network architecture in which one or more programs (clients) request computing or data services from another program (the server).

client system options file. An editable file that contains communication, authorization, central scheduling, backup, archive, and space management options. A root user on your workstation sets the options in a client system options file. The file name is **dsm.sys** located in your Tivoli Storage Manager installation directory.

client user options file. A user-editable file containing options that identify the Tivoli Storage Manager server to contact, specify backup, archive, restore, retrieve, and space management options, and set date, time, and number formats. The file name is **dsm.opt** located in your Tivoli Storage Manager installation directory.

closed registration. A registration process in which a Tivoli Storage Manager administrator must register workstations as client nodes with the server. Contrast with *open registration*.

command line interface. A type of user interface where commands are specified on the command line. Contrast with *graphical user interface*.

communication method. The method by which a client and server exchange information. For Tivoli Storage Manager backup-archive clients, the method can be TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

communication protocol. A set of defined interfaces that permits computers to communicate with each other.

copy group. A policy object that contains attributes that control backup and archive file:
- Generation
- Destination
- Expiration.

Backup and archive copy groups belong to management classes. See *frequency*, *destination*, *mode*, *retention*, *serialization*, and *version*.

D

default management class. A management class assigned to a policy set. This class is used to govern backed up or archived files when a user does not explicitly associate a file with a specific management class through the include-exclude list.

destination. A copy group attribute that specifies the storage pool in which to back up or archive a file. At installation, Tivoli Storage Manager provides two storage destinations named **backuppool** and **archivepool**.

domain. See *policy domain* or *client domain*.

drag. Move the mouse while holding down the mouse button, thus moving the selected object.

drag-and-drop. Move (drag) an object on top of another object and release the mouse button, thus relocating the object.

dsm.opt file. See *options file*. See also *client user options file*. Also called client options file.

dsm.sys file. See *options file* or *client system options file*.

dynamic. A copy group serialization value that specifies Tivoli Storage Manager accept the first attempt to back up or archive an object, regardless of any changes made during backup or archive processing. See *serialization*. Contrast with *shared dynamic*, *shared static*, and *static*.

E

error log. A text file written on disk that contains Tivoli Storage Manager processing error messages. The Tivoli Storage Manager server detects and saves these errors.

exclude. To identify files in an include-exclude list that you do not want to include in a specific client operation, such as backup or archive.

exabyte (EB). (1) For processor storage, real and virtual storage, and channel volume, 1,152,921,504,606,846,976 bytes. (2) For disk storage capacity and communications volume, 1,000,000,000,000,000,000 bytes.

expiration. The process in which files are identified for deletion because their expiration date or retention period is passed. Backups or archives are marked for deletion based on the criteria defined in the backup or archive copy group.

F

file server. A dedicated computer and its peripheral storage devices connected to a local area network that stores both programs and files shared by users on the network.

file space. A logical space on the Tivoli Storage Manager server that contains a group of files. In Tivoli Storage Manager, users can restore, retrieve, or delete file spaces from Tivoli Storage Manager storage. A file space for systems:

- **Windows**— file spaces for removable media are identified by volume label. Fixed drive file spaces are identified by Universal Naming Convention (UNC) name.
- **UNIX** — Logical space that contains a group of files backed up or archived from the same file system, or part of a file system defined with the virtualmountpoint option in the client system options file.

frequency. A copy group attribute that specifies the minimum interval, in days, between incremental backups.

fuzzy backup. A backup version of a file that might not accurately reflect what is currently in the file because the file was backed up at the same time as it was being modified.

fuzzy copy. An archive copy of a file that might not accurately reflect what is currently in the file because Tivoli Storage Manager archived the file while the file was being modified.

G

generate password. Processing that stores a new password in an encrypted password file when the old password expires. Automatic generation of a password prevents password prompting. Password generation can be set in the options file (passwordaccess option). See *options file.*

gigabyte (GB). (1) One billion (10^9) bytes. (2) When referring to memory capacity, 1 073 741 824 in decimal notation.

GPFS node set. A set of AIX SP nodes that can mount a defined group of GPFS file systems.

graphical user interface (GUI). A graphical user interface offers pictoral rather than text-based access to a computer. A graphical user interface includes:

- A combination of graphics and icons
- Use of a mouse or pointing device
- Menu bars, dropdown lists, and overlapping windows

Contrast with *command line interface.* See *windowed interface*.

GUI. Graphical user interface.

H

hierarchical storage management client. A program that runs on a workstation or file server to provide space management services. The hierarchical storage management client automatically migrates eligible files to Tivoli Storage Manager storage to maintain specific levels of free space on local file systems. Automatic recalls are made for migrated files when they are accessed. Users are also permitted to migrate and recall specific files.

HSM. Hierarchical Storage Management.

I

image. A full file system or raw logical volume backup as a single object.

inactive version. A copy of a backup file in Tivoli Storage Manager storage that either is not the most recent version, or the corresponding original file was deleted from the client file system. Inactive backup versions are eligible for expiration according to the management class assigned to the file.

include-exclude file. A file containing statements to determine the files to back up and the associated management classes to use for backup or archive. See *include-exclude list*.

include-exclude list. A list of include and exclude options that include or exclude selected files for backup. An exclude option identifies files that should not be backed up. An include option identifies files that are exempt from the exclusion rules or assigns a management class to a file or a group of files for backup or archive services. The include-exclude list is defined in one or more include-exclude files or in the client system options file. The include-exclude list may contain entries from any or all of the following sources: the client options file (Windows), the client system options file (Unix), separate include-exclude files, or the Tivoli Storage Manager server. See *options file*.

incremental backup. A function that permits user to back up new or changed files or directories from a client domain or from specified file systems, directories, or files. These file systems, directories, or files are not excluded in the include-exclude list and meet the requirements for frequency, mode, and serialization as defined by a backup copy group of the management class assigned to each file. Contrast with *selective backup*.

inode. A data structure that describes the individual files in an operating system. There is one inode for each file. The number of inodes in a file system, and therefore the maximum number of files a file system can contain, is set when the file system is created. Hardlinked files share the same inode.

inode number. A number that specifies a particular inode in a file system.

IPL. Initial Program Load. See *boot* and *reboot*.

L

LAN. Local area network.

LAN-free data transfer. The movement of client data between the client and a storage device over a SAN, bypassing the LAN.

Local Area Network (LAN). A variable-sized communications network placed in one location. LAN connects servers, PCs, workstations, a network operating system, access methods, and communications software and links.

logical unit number (LUN). A logical unit number (LUN) is a unique identifier used on a SCSI bus that enables it to differentiate between up to eight separate devices (each of which is a logical unit). Each LUN is a unique number that identifies a specific logical unit, which may be a hard disk, tape drive, or other device which understands the SCSI protocol.

logical volume backup. A back up of a file system or logical volume as a single object

Loopback Virtual File System (LOFS). A file system created by mounting a directory over another local directory, also known as mount-over-mount. A LOFS can also be generated using an automounter.

M

management class. A policy object that is a named collection of copy groups. A management class is associated with a file to specify how the server should manage backup versions or archive copies of workstation files. See *binding* and *copy group*.

mode. A copy group attribute that specifies whether a backup file should be created for a file that was not modified since the last time the file was backed up. See *absolute* and *modified*.

modified. A backup copy group attribute indicating a file is considered for backup only if the file has been changed since the last backup. A file is considered changed if the date, size, owner, or permissions have changed. See *absolute* and *mode*.

N

NAS node. A type of node that is a NAS file server. The NAS node name uniquely identifies the NAS file server and its data to Tivoli Storage Manager. Through support of Network Data Management Protocol (NDMP), Tivoli Storage Manager can efficiently back up and restore NAS file systems to tape drives or libraries that are locally attached to the NAS file servers.

NDMP. Network Data Management Protocol.

Network Attached Storage (NAS) file server. A network attached storage (NAS) device is a specialized file-serving box whose operating system is streamlined and optimized for file-serving functions. Through support of Network Data Management Protocol (NDMP), Tivoli Storage Manager can efficiently back up and restore NAS file systems to tape drives or libraries that are locally attached to the NAS file servers.

Network Data Management Protocol. Open standard network protocol. Enables efficient back up and restore of Network Attached Storage (NAS) file systems to tape drives or libraries that are locally attached to the NAS file servers.

network data transfer rate. The data transfer rate calculated by dividing the total number of bytes transferred by the data transfer time. For example, the time spent transferring data over the network.

node. See *client node*.

node name. A unique name used to identify a workstation, file server, or PC to the server.

O

offline volume backup. During an offline volume image backup, the volume is locked so that no other system applications can access it during the operation.

online volume backup. During an online volume image backup, the volume is available to other system applications during the operation.

open registration. A registration process in which users can register their own workstations or PCs as client nodes with the server. Contrast with *closed registration*.

options file. A file that contains processing options.

- **dsm.opt**

  Non-UNIX — Identifies Tivoli Storage Manager servers, specifies communication methods, defines scheduling options, selects backup, archive, restore, and retrieve options. Also called the client options file.

  UNIX — Identifies the Tivoli Storage Manager server to contact, specifies backup, archive, restore, and retrieve options. Also called the client users options file.
- **dsm.sys**

  UNIX — Contains stanzas describing Tivoli Storage Manager servers to contact for services. These stanzas also specify communication methods, backup and archive options, and select scheduling options. Also called the client system options file.
- **TSM User Preferences file** For the Macintosh client only: Identifies Tivoli Storage Manager servers, specifies communication methods, defines scheduling options, selects backup, archive, restore, and retrieve options. Also called the client options file.
- **TSM System Preferences file** For the Macintosh client only: Contains stanzas describing Tivoli Storage Manager servers to contact for services. These stanzas also specify communication methods, backup and archive options, and select scheduling options.

owner. The owner of backup-archive files sent from a multi-user client node, such as AIX.

P

pattern-matching character. See *wildcard character*.

plug-in. A self-contained software component that modifies (adds or changes) function in a particular software system. When you add a plug-in to a software system, the foundation of the original software system remains intact.

policy domain. A policy object that contains one or more policy sets. Client nodes are associated with a policy domain. See *policy set*, *management class*, and *copy group*.

policy set. A policy object that contains a group of management class definitions that exist for a policy domain. At any one time, there can be many policy sets within a policy domain, but only one policy set can be active. See *active policy set* and *management class*.

progress indicator. A control used to inform a user about the progress of a process.

R

raw logical volume. A portion of a physical volume which is comprised of unallocated blocks and has no Journaled File System (JFS) definition. A raw logical volume is read/write accessible only through low level I/O functions.

reboot. To restart the operating system.

registration. The process of identifying a client node or administrator to the server by specifying a user ID, password, and contact information. For client nodes, a policy domain, compression status, and deletion privileges are also specified.

restore. A function that permits users to copy a version of a backup file from the storage pool to a workstation or file server. The backup copy in the storage pool is not affected. Contrast with *backup*.

retention. The amount of time, in days, that inactive backed up or archived files are retained in the storage pool before they are deleted. The following copy group attributes define retention: retain extra versions, retain only version, retain version.

retrieve. A function permitting users to copy an archived file from the storage pool to the workstation or file server. The archive copy in the storage pool is not affected. Contrast with *archive*.

root user (UNIX). The authority level for a root user permits this user to do authorized tasks for Tivoli Storage Manager.

S

SAN. Storage area network.

scheduling mode. The type of scheduling operation for the client-server node. Tivoli Storage Manager supports two scheduling modes: client-polling and server-prompted.

scroll. Move through a list of items in a window by operating the scrollbars with the mouse cursor.

select. Choose an item from a list or group of items.

selective backup. A function permitting users to back up specified files. These files are not excluded in the include-exclude list and meet the requirement for serialization in the backup copy group of the management class assigned to each file. Contrast with *incremental backup*.

serialization. A copy group attribute that specifies whether a file can be modified during a backup or archive operation. See *static*, *dynamic*, *shared static*, and *shared dynamic*.

server. A program running on a mainframe, workstation, or file server that provides shared services such as backup and archive to other various (often remote) programs (called clients).

server-prompted scheduling. A client-server communication technique where the server contacts the client node when tasks need to be done.

session. A period of time in which a user can communicate with a server to perform backup, archive, restore, or retrieve requests.

shared dynamic. A Tivoli Storage Manager copy group serialization mode. This mode specifies if a file changes during backup or archive and continues to change after a number of retries. The last retry commits the file to the Tivoli Storage Manager server whether or not the file changed during backup or archive. Contrast with *dynamic*, *shared static*, and *static*.

shared static. A copy group serialization value specifying that a file must not be modified during a backup or archive operation. Tivoli Storage Manager attempts to retry the operation a number of times. If the file is in use during each attempt, the file is not backed up or archived. See *serialization*. Contrast with *dynamic*, *shared dynamic*, and *static*.

share point. A drive or directory on Windows NT, 2000, Me, XP, or Windows.Net whose files are available for shared access across a network. The share point name is part of a UNC name. See *Universal Naming Convention (UNC)* name.

shift-click. Click on an item while pressing the Shift key.

space management. The process of keeping sufficient free storage space available on a local file system for new data and making the most efficient and economical use of distributed storage resources.

special files. Special files define devices for the system or temporary files created by processes. There are three basic types of special files: FIFO (first-in, first-out), block, and character. FIFO files are also called pipes. Pipes are created by one process to temporarily allow communication with another process.These files cease to exist when the first process finishes. Block and character files define devices. Tivoli Storage Manager processes only device and named pipe special files. Socket special files are not processed.

snapshot. An image backup type. A snapshot is a point-in-time view of a volume. When you perform an online image backup, the Logical Volume Snapshot Agent (LVSA) takes a snapshot of the volume. Any changes that occur to the volume after the snapshot begins are not included in the backup.

stabilized file space. A file space that exists on the server but not on the client. This situation can arise in at least two instances:
1. A drive is removed from a client workstation
2. A file space is renamed on the server

Stabilized file spaces remain on the server until deleted by the user or administrator. Files and directories can be restored and retrieved from a stabilized file space. However, it is not possible to back up or archive data to a stabilized file space.

stanza. In the AIX OS, a stanza is a group of lines in a file that together have a common function or define a part of the system. The Tivoli Storage Manager Client System Options file (**dsm.sys**) contains a stanza for each server to which the client can connect. Each stanza begins with the ***servername*** option and ends at the next ***servername*** option or the end of file, whichever comes first. Each stanza must include communications options.

static. A copy group serialization value specifying that a file must not be modified during a backup or archive operation. If the file is in use during the first attempt, Tivoli Storage Manager will not back up or archive the file. See *serialization*. Contrast with *dynamic*, *shared dynamic*, and *shared static*.

storage area network (SAN). A high-speed communications network optimized for storage.

storage agent. A program that enables Tivoli Storage Manager to back up and restore client data directly to and from SAN-attached storage.

storage pool. A named set of storage volumes used as the destination of backup, archive, or migrated copies.

system drive or partition. On Windows NT, the drive or partition on which Windows NT is installed.

T

TCA. Trusted Communications Agent

TCP/IP. Transmission Control Protocol/Internet Protocol.

timeout. A time event involving:
- An event that happens at the end of a predetermined period of time that began at the happening of another specified event.
- A time interval allotted for certain operations to happen. For example, response to polling or addressing before system operation is interrupted and must be restarted.
- A terminal feature that logs off a user if an entry is not made within a specified period of time.

Tivoli Storage Manager. A client-server licensed program product that provides storage management and data access services to customers in a multivendor computer environment.

Transmission Control Protocol/Internet Protocol (TCP/IP). A standard set of communication protocols that supports peer-to-peer connectivity of functions for both local and wide-area networks.

Trusted Communications Agent (TCA) (UNIX). A program that can handle the sign-on password protocol when password access is generated. The main process (for example, ***dsm***, ***dsmc***) makes a run time decision based on the password access option setting, the user ID, and the executables' access privileges to run this program. The file that contains this program must have the 's' bit set in its mode field and the owner must be root.

V

version. Storage management policy may allow back-level copies of backed up objects to be kept at the server whenever an object is newly backed up. The most recent backed up copy is called the ″active″ version. Earlier copies are ″inactive″ versions. The following backup copy group attributes define version criteria: versions data exists, and versions data deleted.

W

wildcard character. An asterisk (*) or question mark (?) character used to represent multiple (*) or single (?) characters when searching for various combinations of characters in alphanumeric and symbolic names.

windowed interface. A type of user interface that is either a graphical user interface or a text-based interface. The text-based interface maintains a close affinity to the graphical user interface, including action bars and their associated pull-down menus and windows. See *graphical user interface*.

workstation. A programmable high-level workstation (usually on a network) with its own processing hardware such as a high-performance personal computer. In a local area network, a personal computer that acts as a single user or client. A workstation can also be used as a server.

world wide name. A unique 48 or 64 bit number assigned by a recognized naming authority (often via block assignment to a manufacturer) that identifies a connection or a set of connections to the network. Abbreviated WWN. A WWN is assigned for the life of a connection (device). Most networking technologies (e.g., Ethernet, FDDI, etc.) use a world wide name convention.

Index

Special Characters

? 71
* 71, 81
* ? 72

A

absolute mode 101
access
  control lists, backup 58
  deleting 287
  extended permissions, backup 58
  permissions, archive 87
  permissions, backup 58
  querying 301
ACL
  file systems supported 294
  setting for AFS directories and files 339
  setting for DFS directories and files 339
active files
  displaying 49, 303
AFS
  backup using dsmcafs command 58
  using dsmafs command 58
AFS file backup clients 335
AFS/DFS backup clients 54
afsbackupmntpnt option 122, 336
AIX
  HACMP takeover environment 341
    installing TSM 341
AIX 5L client
  installing 12
AIX client
  client components 3
  communication methods 4
  considerations when upgrading from ADSM AIX 3.1 2, 11, 13
  hardware requirements 4
  installing 10
  operating system requirements 4
  software requirements 4
application program interface (API)
  environment variables
    UNIX 40
archive
  allocated memory required for processing
    UNIX restrictions 58
  binding management classes to files 104
  command 279
  copy mode 101
  delete file spaces 83
  delete files from 86
  deleting 288
  estimating processing time 85
  grace period retention 98
  hard links 88
archive *(continued)*
  how managed 89, 97
  maximum file size 275
  overriding managment class during 103
  purpose 54
  running 85
  sorting file list 49
  symbolic links 87
  using commands 87
  using the Web client 44
archive command 60
archive copy group 98
  attributes 99
archived files
  display 302
  summary of options 112
archmc option 236
archsymlinkasfile option 123
authorization
  summary of options 117
authorization rule
  deleting 287
  querying 301
authorized user
  definition xi, 1
  tasks 1
authorizing
  groups to use Tivoli Storage Manager 157
  Tivoli Storage Manager users 223
  user to restore or retrieve your files 81
automating backup-archive services
  central scheduling 91
  using client scheduler 91
automount option 124
automounted file systems
  backing up 140

B

back up
  using LAN-Free Data Movement 66
backing up
  summary of options 112
backup
  access control lists 58
  access permissions 58
  advanced considerations 66
  allocated memory required for processing
    UNIX restrictions 58
  automounted file systems 140
  beginning with a specific directory 58
  binding management classes to files 104
  copy mode 101
  delete file spaces 83
  directory tree filter 59
backup *(continued)*
  displaying active and inactive 74
  displaying processing status 61
  enabling communications for LAN-Free Data Movement 167, 169, 170
  estimating processing time 59
  excluding files from backup services 55
  excluding files from space manager services 55
  extended permissions 58
  files, management class 102
  filtering files 59
  fuzzy 101
  GPFS, multi-node cluster environment 139, 296
  grace period retention 98
  groups of files 60
  hard links 70
  image 62
    considerations 63
    offline and online 62
    restrictions for incrmental-by-date 64
    specify type 161
    supported devices 63
    using command line 64
    using DSM_DIR to point to plug-in library 38
    using the GUI 64
  inactivate a list of files 291
  incremental 59
    restrictions for directories 56
  incremental-by-date 57, 59
    restrictions for directories 57
    restrictions for image backup 64
  LAN-based image 280
  managing 97
  maximum file size 275
  NAS
    using DSM_DIR to point to plug-in library 38
  NAS file systems 66, 347
  new and changed files 55, 56
  online image
    specify percent value of the target volume to create 209
  opened files 71
  overview 55
  performance comparison between incremental and incremental-by-date 57
  purpose 54
  requirements 68
  saving encryption key password 148
  searching files 59
  selective 58, 59
  server-free image 280
  sorting file list 49
  subdirectories 60

© Copyright IBM Corp. 1993, 2002

backup *(continued)*
symbolic links 68
using LAN-Free Data Movement 146
using multiple sessions 61
using the Web client 44
backup copy group 98
attributes 99
backup image command 280
supported devices 63
backup NAS command 283
backup set
enabling GUI for local restore 79
enabling GUI for local restore of 172
restore 79
backup sets
restoring in a SAN environment 318
backup-archive client
overview 1
batch mode 273
starting a session 43
bottom up processing
include-exclude list 34
include-exclude options file 34
Bourne and Korn shell
pointing to client user options file 109
Bourne and Korn shell variables, setting 39

C

C shell 108
cancel process command 285
cancel restore command 286
central scheduling
summary of options 115
changingretries option 125
class option 237
client
registering with server 28
setting password 28
client acceptor daemon
use to manage scheduler 174
use to manage scheduler and Web client 174
use to manage Web client 174
client command options 274
archmc 236
class 237
clusternode 126
deletefiles 238
description 239
detail 240
dfsbackupmntpnt 136
dirsonly 241
filelist 242
filesonly 244
fromdate 245
fromnode 246
fromowner 247
fromtime 248
ifnewer 249
inactive 250
incrbydate 251
incremental 252
latest 253
noprompt 257
client command options *(continued)*
overriding the client options file 231
pick 259
pittime 261
preservepath 262
todate 265
totime 266
type 267
using options with commands 231
v2archive 268
volinformation 269
client commands
overriding client options file 120
client components
AIX client 3
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
client options 274
archsymlinkasfile 123
automount 124
changingretries 125
commmethod 127
commrestartduration 128
commrestartinterval 129
compressalways 130
compression 131
dateformat 133
defaultserver 135
dfsbackupmntpnt 136
dirmc 138
domain 139
domain.image 142
domain.nas 143
editor 145
enablelanfree 146
errorlogname 150
errorlogretention 151
exclude
exclude.archive 30, 152
exclude.backup 30, 152
exclude.compression 30, 152
exclude.dir 30, 152
exclude.encrypt 152
exclude.file 30, 152
exclude.file.backup 30, 152
exclude.fs 30, 152
exclude.fs.nas 152
exclude.image 30, 152
followsymbolic 156
groups 157
guitreeviewafterbackup 158
httpport 159
httpsport 160
imagetype 161
inclexcl 162
include 163
include.archive 163
include.backup 163
include.compression 163
include.encrypt 163
include.file 163
include.fs.nas 163
client options *(continued)*
include.image 163
lanfreecommmethod 167
lanfreeshmport 169
lanfreetcpport 170
largecommbuffers 171
localbackupset 172
location 254
mailprog 173
managedservices 174
maxcmdretries 176
memoryefficientbackup 177
mode 255
monitor 256
nfstimeout 179
nodename 180
numberformat 182
optfile 258
overriding using command line 120
password 184
passwordaccess 185
passworddir 187
pitdate 260
postnschedulecmd 188
postschedulecmd 188
prenschedulecmd 190
preschedulecmd 190
queryschedperiod 192
quiet 193
replace 194
resourceutilization 195
retryperiod 197
revokeremoteaccess 198
schedcmddisabled 199
schedlogname 200
schedlogretention 201
schedmode 202
scrolllines 204
scrollprompt 205
servername 206
setting in a file 119
shmport 208
snapshotcachesize 209
subdir 210
tapeprompt 212
tcpbuffsize 213
tcpclientaddress 214
tcpclientport 215
tcpnodelay 216
tcpport 217
tcpserveraddress 218
tcpwindowsize 219
timeformat 220
txnbytelimit 222
users 223
using with commands 120
verbose 224
virtualmountpoint 225
virtualnodename 227
webports 229
client options file
creating and modifying 25
required options for 25
client scheduler
connecting to server schedule 93
displaying completed work 95
displaying scheduled work 94

client scheduler *(continued)*
scheduled command 93
starting 93, 327
starting automatically 48
client system options
automount 124
changingretries 125
commmethod 127
commrestartduration 128
commrestartinterval 129
compression 131
defaultserver 135
dirmc 138
editor 145
enablelanfree 146
errorlogretention 151
exclude
exclude.archive 30, 152
exclude.backup 30, 152
exclude.compression 30, 152
exclude.dir 30, 152
exclude.file 30, 152
exclude.file.backup 30, 152
exclude.fs 30, 152
exclude.fs.nas 152
groups 157
httpport 159
httpsport 160
imagetype 161
inclexcl 162
include 163
include.archive 163
include.backup 163
include.compression 163
include.file 163
include.fs.nas 163
include.image 163
lanfreecommmethod 167
lanfreeshmport 169
lanfreetcpport 170
largecommbuffers 171
localbackupset 172
mailprog 173
managedservices 174
maxcmdretries 176
nasnodename 178
nfstimeout 179
nodename 180
passwordaccess 185
passworddir 187
postnschedulecmd 188
postschedulecmd 188
prenschedulecmd 190
preschedulecmd 190
queryschedperiod 192
resourceutilization 195
retryperiod 197
schedcmddisabled 199
schedlogname 200
schedlogretention 201
schedmode 202
scrolllines 204
servername 206
shmport 208
snapshotcachesize 209
tcpbuffsize 213
tcpclientaddress 214
client system options *(continued)*
tcpclientport 215
tcpnodelay 216
tcpport 217
tcpserveraddress 218
tcpwindowsize 219
txnbytelimit 222
users 223
virtualmountpoint 225
client system options file
copying and modifying 25
creating and modifying 107
example of 25
minimum required statements 25
setting options 119
specifying include-exclude options 29
client system options file, UNIX
options placed before server stanzas 121
client user options file
creating and modifying 108
setting options 119
client-server communications
establishing 25
closed registration
permissions 28
using 28
clusternode option 126
command line
archiving files 87
displaying processing status 61
ending a session 50
overriding managment class during archive 103
performing image backup 64
performing large restore operations 76
performing point-in-time restore 78
restrictions for NAS file systems 347
retrieving archived files 89
starting a session 42
using for incremental backup 60
using for selective backup 60
command line interface
return codes from 91
command name 274
command parameters
optional 274
required 274
command processing, summary of options 116
command rules 277
commands
archive 279
backup image 280
backup NAS 283
batch mode 273
cancel process 285
cancel restore 286
delete access 287
delete archive 288
delete filespace 289
dsm 42
dsm.afs 335
dsmafs 335
dsmc.afs 335
commands *(continued)*
dsmcafs 335
dsmcdfs 335
dsmdfs 335
expire 291
help 292
incremental 60, 293
interactive (loop) mode 273
loop 298
macro 299
monitor process 300
number of files specifications permitted 275
query access 301
query archive 302
query backup 303
query backupset 305
query filespace 306
query image 307
query inclexcl 308
query mgmtclass 309
query node 310
query restore 311
query schedule 312
query session 313
recall previous 276
restart restore 314
restore 315
restore backupset 318
restore image 321
restore NAS 323
retrieve 325
schedule 327
scheduled, enabling or disabling 96
selective 60, 329
set access 331
set password 333
using in executables 91
using in shell scripts 91
using options with 120
commmethod option 127
commrestartduration option 128
commrestartinterval option 129
communication methods
Shared Memory
AIX client 4
HP-UX client 5
Solaris client 8
summary 109
TCP/IP
AIX client 4
HP-UX client 5
linux for zSeries or S/390 client 6
linux86 client 6
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
communication with server
setting up
Windows Me, NT, 2000, .NET clients 28
communications
establishing through firewall 47
compressalways option 130
compression option 131
compression processing 131, 152, 163

configuring
optional tasks 25
required tasks 25
copy destination attribute 101
copy frequency attribute 99
copy group name attribute 99
copy groups 97
archive 98
backup 98
copy mode attribute
absolute 101
modified 101
copy serialization attribute 100
copy type attribute 99

D

dateformat option 133
default
management class 97
policy domain 97
default client user options file
creating and modifying 26
example of 26
defaultserver option 135
delete
access command 287
archived files 86
file space 83
deletefiles option 238
description option 239
detail option 99, 240
DFS
backup using dsmdfs command 58
specifying an include-exclude file 29
using dsmcdfs command 58
DFS file backup clients 335
dfsbackupmntpnt option 136, 337
dfsinclexcl option 137
directories
restrictions on processing during incremental backup 56
restrictions on processing during incremental-by-date 57
directory
management classes 138
specifying 274
dirmc option 138
dirsonly option 241
disaster recovery 82
disk recovery 82
disk space requirements
AIX client 4
client 3
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
display
active and inactive backup versions 74
policy information 99
displaying
active backup versions 49
displaying *(continued)*
archived files 302
backed up files 303
inactive backup versions 49
messages 224
messages, stopping 193
online help 50
restartable restore sessions 311
scheduled events 312
session information 313
domain
backing up automounted file systems 140
domain option 60, 139
setting 337
domain.image option 142
domain.nas option 143
dsm and dsmc
executable files 335
dsm command 42
DSM_CONFIG 38
adding to .cshrc file 40
pointing to client user options file 38, 109
using on Solaris 38
DSM_DIR
adding to .cshrc file 40
pointing to dsm.sys file 38
pointing to executable files 38
pointing to resource files 38
set for image or NAS backup or restore 38
dsm_log 39
DSM_LOG
adding to .cshrc file 40
set to point to dsmerror.log, dsmwebcl.log, dsmsched.log 38
dsm, dsmc commands
dsm 335
dsmafs 335
dsmc 335
dsmcafs 335
dsmcdfs 335
dsmdfs 335
dsm.opt file
creating 26
creating and modifying 108
creating and modiying 25
example of 26
required options for 25
dsm.opt.smp file 26
creating client user options file 108
dsm.smp file
copying to dsm.opt 25
location 25
dsm.sys file
creating 25
creating and modifying 107
example of 25
dsm.sys.smp file 25
copying to dsm.sys 107
dsmafs command
to back up AFS files 58
dsmcafs command
to back up AFS files 58
dsmcdfs command
to back up DFS files 58
dsmdfs command
to back up DFS files 58
dsmerror.log 39
set DSM_LOG to point to 38
DSMI_CONFIG environment variable
API, UNIX 40
DSMI_DIR environment variable
API, UNIX 40
DSMI_LOG environment variable
API, UNIX 40
dsmsched.log file 95
dsmtca executable file
set DSM_DIR to point to 38
dynamic and shared serialization 100

E

editor option 145
enablelanfree option 146
encrypting file data 55
encryption
excluding files 152
saving encryption key password 148
encryptkey 55
encryptkey option 148
ending a command line session 50
ending a GUI session 50
entering client commands 274
entering commands 277
environment prerequisites
AIX client 3
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 6
Silicon Graphics IRIX client 7
Solaris client 8
environment variables
API, UNIX 40
DSM_CONFIG 38
DSM_DIR 38
DSM_LOG 38
LANG 38
setting Bourne and Korn shell 39
setting C shell 40
error log 38
pruning 151
error processing, summary of options 117
errorlogname option 150
errorlogretention option 151
estimate function 59
exclude option
exclude.archive 30
exclude.backup 30
exclude.compression 30
exclude.dir 30
exclude.file 30
exclude.file.backup 30
exclude.fs 30
exclude.image 30
processing 34
to exclude system files 32
wildcard characters 33, 34
exclude options
exclude.archive 152

exclude options *(continued)*
exclude.backup 152
exclude.compression 152
exclude.dir 152
exclude.encrypt 152
exclude.file 152
exclude.file.backup 152
exclude.fs 152
exclude.fs.nas 152
exclude.image 152
exclude.encrypt 152
exclude.fs, setting the 336
exclude.fs.nas option 152
exclude.image option 30, 152
excluding files
system files 32
using wildcard characters 34
wildcard characters 33
executable files
dsm and dsmc 335
executables
return codes from 91
expire command 291
extended permissions
archive 87
backup 58

F

file space
delete 83, 289
performing an image backup 280
file specification
number permitted on commands 275
file specification syntax
maximum file specifications in command 274
specifying 274
file systems
ACL support for 294
adding 60
GPFS, multi-node cluster environment 139, 296
image backup of 62
QFS, restrictions 295
supported 294
filelist option 242
files
archive using commands 87
archived, overriding management class 103
archives, how manage 89
archiving 85, 279
assigning management classes 68
authorizing another user to restore or retrieve 81
back up, using command line 60
backing up hard-linked 70
backing up new and changed 55
backing up opened 71
binding management classes to 104
definition of changed 56
encryption 55
excluding groups 33, 34
how stored 66
including groups 33, 34
maximum file size for operations 275
files *(continued)*
performing large restore operations 76
processing include-exclude 34
restore, point-in-time 77
restore, using commands 81
restore/retrieve to another workstation 82
restoring 73, 75
restoring another user's 81
restoring hard-linked 70
retrieve archived 88
retrieve using commands 89
sorting list 49
filesonly option 244
firewall
establishing communications through 47, 159, 217
specifying TCP/IP ports for the Web client 229
using Web client through 229
followsymbolic option 156
font defaults
setting in .Xdefaults file 38
format
summary of options 116
fromdate option 245
fromnode option 246
restoring/retrieving another user's files 81
fromowner option 247
restoring/retrieving another user's files 81
fromtime option 248
full incremental
comparing performance with incremental-by-date 57
description 56
when to use 57
fuzzy backup 101

G

GPFS file system
multi-node cluster environment 139, 296
graphical user interface
changing password 48
displaying online help 50
displaying processing status 61
enabling for local backup set restore 172
enabling local backup set 79
ending a session 50
performing image backup 64
starting a session 42
groups option 157
GUI
overriding managment class during archive 103
performing point-in-time restore 77
guitreeviewafterbackup option 158

H

HACMP takeover environment
installing TSM 341
hard links
archive and retrieve 88
backing up 70
restoring 70
hard mounts, NFS 70
hardware requirements
AIX client 4
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
help
displaying online 50
online forum 50
service and technical support 50
help command 292
HP-UX client
client components 4
communication methods 5
hardware requirements 4
installing 14
operating system requirements 4
software requirements 5
httpport option 159
https secure socket layer (SSL)
specifying TCP/IP port address for 160
httpsport option 160

I

identifying
DFS include-exclude file 137
identifying AFS user accounts 225
ifnewer option 249
image
backup 62
considerations 63
backup image command 280
restoring 78
image backup
backing up a file space 63
considerations 63
example 65
file systems or logical volumes 280
incremental-by-date, restrictions 64
offline and online 62
perform 62
point-in-time restore 280
server-free 280
supported devices 63
using mode option 281
using the GUI 64
inactive files
displaying 49, 303
inactive option 250
inclexcl option 162
include option
management class 102
processing 34

include option *(continued)*
wildcard characters 33, 34
include options
include 163
include.archive 163
include.backup 163
include.compression 163
include.encrypt 163
include.file 163
include.fs.nas 163
include.image 163
include-exclude file 137
include-exclude list
creating 29
query order of processing 308
include-exclude options file
bottom up processing 34
description 55
specifying path and file name of 162
to manage archives 89
Unicode-enabled file spaces 162
include-exclude options list
creating 29
incrbydate option 251
incremental backup
description 56
GPFS, multi-node cluster environment 139, 296
new and changed files 56
of directories
restrictions 56
performing 59
requirements 68
symbolic links 68
incremental command 293
incremental option 252
incremental-by-date
comparing performance with incremental 57
description 57
image backup restrictions 64
of directories
restrictions 57
performing 59
using command line 60
when to use 57
installation requirements
AIX client 3
client 3
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 6
Silicon Graphics IRIX client 7
Solaris client 8
Installation requirements
AIX client
considerations when upgrading from ADSM AIX 3.1 2
installing
AIX 5L client 12
AIX client 10
HP-UX client 14
linux390 client 18
linux86 client 16
overview 23
installing *(continued)*
Silicon Graphics IRIX client 20
Solaris client 21
installing from server CD-ROM 8
installing Tivoli Storage Manager
CD-ROM, installing from 8
installing TSM
HACMP takeover environment 341
interactive mode 273
interactive session
ending 298
starting 43, 298
using 298

K

kerberos login, setting 339

L

LAN-Free Data Movement
enabling 66, 146
enabling communications for 167, 169, 170
options 66
prerequisites 66
lanfreecommmethod option 167
lanfreeshmport option 169
lanfreetcpport option 170
LANG environment variable
setting language locale 36
language locales
supported 36
largecommbuffers option 171
latest option 253
restore latest backup version 81
linux for zSeries or S/390 client
client components 6
communication methods 6
hardware requirements 6
operating system requirements 6
linux390 client
installing 18
linux86 client
client components 5
communication methods 6
hardware requirements 5
installing 16
operating system requirements 5
local backup set
enabling GUI for local restore 79
localbackupset option 172
location option 254
log
pruning error 151
logical volume
image backup of 62
restoring 78
Logical Volume Snapshot Agent
installing and configuring 62
loop command 298
LVSA
installing and configuring 62

M

macro command 299
mailprog option 173
managedservices option 174
management class
assigning 68
management classes
assigning to directories 103, 138
assigning to files 102
binding to files 104
default 97
displaying 99
displaying information about 309
overriding during archive processing 103
overriding the default 102
processing 102
questions to consider 102
selecting for files 102
specifying with include option 102
using management class, example 102
maxcmdretries option 176
memory
required for client processing
UNIX restrictions 58
memory requirements
AIX client 4
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
memoryefficientbackup option 177
messages
displaying on screen 224
stop displaying 193
migrated files
restoring 73
migrating from earlier versions of the product 1
mode option 255
performing an image backup 281
mode parameter 99
modes
batch 273
interactive (loop) 273
modified mode 99, 101
monitor option 256
monitor process command 300
mount points
afs 336
dfs 336
potential problems 336
multiple sessions
backup objects, using 61

N

naming a server 206
NAS
backing up file systems 66, 347
backup file systems 283
backup NAS command 283

NAS *(continued)*
cancel process command 285
class option 237
deleting file spaces 83, 289
domain.nas option 143
exclude.fs.nas option 152
include volumes in an image backup 143
include.fs.nas option 163
monitor process command 300
monitoring backup or restore operations 256
nasnodename option 178
query node command 310
restore file systems 323
restore NAS command 323
restoring file systems 350
type option 267
nasnodename option 178
Network Attached Storage (NAS) file server
backup file systems 66, 283, 347
deleting file spaces 83, 289
display backup and restore processes to cancel 285
display backup and restore processes to monitor 300
display file spaces on server 306
display nodes for which admin ID has authority 310
monitoring backup or restore operations 256
Querying file system images belonging to 303
restore file systems 323, 350
specifying the node name for 178
NFS
hard mounts 70
soft mounts 70
nfstimeout option 70, 179
NLSPATH environment variable
displaying help browser menu in your language locale 37
to display help browser menu in your language locale 36
no query restore 73
node name 25
Node name field 81
nodename option 180
noprompt option 257
numberformat option 182

O

offline image backup 62
online help
displaying 50
online forum 50
service and technical support 50
online Help forum 50
online image backup 62
online startup information 9
open registration
permissions 28
using 28
operating system requirements
AIX client 4
operating system requirements *(continued)*
clients 3
HP-UX client 4
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
optfile option 258
optional parameters 274
options
afsbackupmntpnt 122, 336
archive, summary 112
archmc 236
archsymlinkasfile 123
authorization, summary 117
automount 124
backup, summary 112
central scheduling, summary 115
changingretries 125
class 237
clusternode 126
command processing, summary 116
commmethod 127
commrestartduration 128
commrestartinterval 129
communication, summary 109
compressalways 130
compression 131
dateformat 133
defaultserver 135
deletefiles 238
description 239
detail 240
dfsbackupmntpnt 136, 337
dfsinclexcl 137
dirmc 138
dirsonly 241
domain 60, 139
domain.image 142
domain.nas 143
editor 145
enablelanfree 146
encryptkey 148
errorlogname 150
errorlogretention 151
exclude
exclude.archive 30, 152
exclude.backup 30, 152
exclude.compression 30, 152
exclude.dir 30, 152
exclude.encrypt 152
exclude.file 30, 152
exclude.file.backup 30, 152
exclude.fs 30, 152
exclude.fs.nas 152
exclude.image 30, 152
wildcard characters 33, 34
exclude.fs 336
filelist 242
filesonly 244
followsymbolic 156
format, summary 116
fromdate 245
fromnode 246
options *(continued)*
fromowner 247
fromtime 248
groups 157
guitreeviewafterbackup 158
httpport 159
httpsport 160
ifnewer 249
imagetype 161
inactive 250
inclexcl 162
include 163
management class, specifying 102
wildcard characters 33, 34
include.archive 163
include.backup 163
include.compression 163
include.encrypt 163
include.file 163
include.fs.nas 163
include.image 163
incrbydate 251
incremental 252
lanfreecommmethod 167
lanfreeshmport 169
lanfreetcpport 170
largecommbuffers 171
latest 253
localbackupset 172
location 254
mailprog 173
managedservices 174
maxcmdretries 176
memoryefficientbackup 177
mode 255
monitor 256
nasnodename 178
nfstimeout 179
nodename 180
noprompt 257
numberformat 182
optfile 258
overriding the client options file 231
password 184
passwordaccess 185
passworddir 187
pick 259
pitdate 260
pittime 261
postnschedulecmd 188
postschedulecmd 188
prenschedulecmd 190
preschedulecmd 190
preservepath 262
queryschedperiod 192
quiet 193
replace 194
resourceutilization 195
restore and retrieve, summary 115
retryperiod 197
revokeremoteaccess 198
schedcmddisabled 199
schedcmduser (server defined only) 96
schedlogname 200
schedlogretention 201
schedmode 202

options *(continued)*
scrolllines 204
scrollprompt 205
servername 206
shmport 208
snapshotcachesize 209
specifying in commands 120
subdir 210
tapeprompt 212
tcpbuffsize 213
tcpclientaddress 214
tcpclientport 215
tcpnodelay 216
tcpport 217
tcpserveraddress 218
tcpwindowsize 219
timeformat 220
todate 265
totime 266
transaction processing, summary 118
txnbytelimit 222
type 267
users 223
using options with commands 231
v2archive 268
verbose 224
virtualmountpoint 225
virtualnodename 227
volinformation 269
Web client, summary 118
webports 229
OS/390 UNIX System Services client
client components 7
communication method 7
hardware requirements 7
operating system requirements 7
overriding the client options file 231

P

parameters, command
optional 274
required 274
password
changing 48, 333
number of characters 49
setting for client 28
using 43
valid characters 49
password option 184
passwordaccess option 185
passworddir option 187
performance
transaction options 118
transaction processing 222
permissions
access, saving standard and extended 87
backup 58
deleting 287
pick option 259
pitdate 260
pittime option 261
plug-in library
for image or NAS backup or restore 38
point-in-time restore 77
point-in-time restore *(continued)*
image backup 280
policies, storage management 97
policy domains
default policy domain 97
standard policy domain 97
policy sets
active policy set 97
portable media
restoring backup sets 79
postnschedulecmd options 188
postschedulecmd options 188
prenschedulecmd option 190
preschedulecmd option 190
preservepath option 262
processing options
afsbackupmntpnt 122
authorization 117
backup and archive 112
central scheduling 115
communication 109
dfsbackupmntpnt 136
dfsinclexcl 137
error processing 117
format 116
node option 110
restore and retrieve 115
server and node 110
setting 119
specifying in commands 120
transaction processing 118
Web client 118
processing time
estimating 59
processing transactions 222
pruning
error log 151

Q

QFS file system
restrictions 295
query
include-exclude list 308
query access command 301
query archive command 302
query backup command 303
query backupset command 305
query filespace command 306
display another user's filespaces 81
query image command 307
query inclexcl command 308
query mgmtclass command 99, 309
query node command 310
query restore command 311
query schedule command 312
query session command 313
queryschedperiod option 192
quiet option 193

R

raw logical volume
image backup of 62
restoring 78
rebinding files to a different management class 104
recall commands 276
registering
client with server 28
using closed registration 28
using open registration 28
replace option 194
required parameters 274
resourceutilization option 195
restart restore command 314
restart interrupted restore 81
restartable restore 73
restartable restore sessions, display 311
restore
another user's files 81
authorizing another user 81
backup sets
overview 79
supported tape devices 318
disk 82
displaying active/inactive backups 74
estimating processing time 59
files 66, 73
files and directories 75
files to another workstation 82
from portable media
overview 79
hard links 70
image 78
using DSM_DIR to point to plug-in library 38
local backup set via GUI 79, 172
logical volume 78
maximum file size 275
NAS
using DSM_DIR to point to plug-in library 38
NAS file systems 350
no query 73
performing large operations 76
point-in-time 77
point-in-time, using command line 78
point-in-time, using GUI 77
processing status window 75
raw logical volume 78
sorting file list 49
summary of options 115
symbolic links 68
UNIX restrictions 69, 315
using commands 81
using the Web client 44
restore backupset command 318
restore command 315
performing large operations 76
restore image command 321
restore NAS command 323
restoring files
AFS or DFS 339
retain extra versions attribute 100
retain only versions attribute 100
retain versions attribute 102
retention grace period
archive 98, 105
backup 98, 105

retrieve
another user's files 81
archived files using commands 89
authorizing another user 81
estimating processing time 85
files to another workstation 82
hard links 88
maximum file size 275
running 88
sorting file list 49
summary of options 115
symbolic links 87
using the Web client 44
retrieve command 325
retry
backup 125
retryperiod option 197
return codes 91
revokeremoteaccess option 198
root user
tasks 1
root user tasks
creating default client user options file 26
setting up 25
rules 97

S

SAN
restoring backup sets using 146, 318
using for LAN-Free data movement 66, 146
schedcmddisabled option 199
schedcmduser option (server defined only) 96
schedlogname option 200
schedlogretention option 201
schedmode option 202
schedule command 327
schedule log
pruning 201
scheduled commands
enabling-disabling 96
scheduled events, displaying 312
scheduled services 91
defining schedules for uid other than 0 96
disabling scheduled commands 199
displaying completed work 95
displaying scheduled work 94
managed by client acceptor 93
managed by client acceptor daemon 174
resolving memory retention after scheduled backups 93, 174
restrictions for NAS file systems 347
running 93
scheduling options 91
starting 93
scheduling options 91
scrolllines option 204
scrollprompt option 205
secure socket layer
Web client 353
selective backup
description 58
selective backup *(continued)*
performing 59
requirements 68
symbolic links 68
selective command 60, 329
serialization
copy serialization
dynamic 100
shared static 100
static 100
server
communicating with
Windows Me, NT, 2000, .NET clients 28
establishing communications through firewall 47
establishing communications with 25
specifying TCP/IP port address for 217
stanza, options placed before 121
server and node options
summary 110
server-free backup
using backup image command 280
servername option 206
service and technical support 50
session information, displaying 313
set access command 331
restore-retrieve authorization 81
set password command 333
setting environment variables
API, UNIX
DSMI_CONFIG 40
DSMI_DIR 40
DSMI_LOG 40
setting language locale 36
setting processing options
AFS/DFS 339
setting the ACLs and DCE login 339
setting the ACLs and kerberos login 339
setting up
required root user tasks 25
setup wizard
using to install and configure LVSA 62
shared dynamic serialization 100, 125
Shared Memory communication method 167
options 110
shared static serialization 100, 125
shell scripts
return codes from 91
using commands in 91
shmport option 208
Silicon Graphics IRIX client
client components 7
communication method 7
hardware requirements 7
installing 20
operating system requirements 7
software requirements 7
socket files
skipped during restore 73
soft mounts, NFS 70
software requirements
AIX client 4
HP-UX client 4, 5
software requirements *(continued)*
linux for zSeries or S/390 client 6
linux86 client 5
OS/390 UNIX System Services client 7
Silicon Graphics IRIX client 7
Solaris client 8
Solaris client
client components 8
communication methods 8
hardware requirements 8
installing 21
operating system requirements 8
software requirements 8
sorting
files 49
space manager
excluding files from services 55
special file systems 68, 294
standard management class
copy destination 101
copy frequency 99
copy group name 99
copy mode
absolute 101
modified 101
copy serialization 100
copy type 99
default values 99
retain extra versions 100
retain only version 100
retain versions 102
versions data deleted
active versions 100
inactive versions 100
versions data exists 100
standard policy domain 97
stanza
server, options placed before 121
starting
a GUI session 42
automatically 48
overview 23
Web client 44
starting a session
batch mode 43
interactive mode 43
static serialization 100
static, shared serialization 100
storage
displaying files 302, 303
displaying restartable restore sessions 311
Storage Agent
using for LAN-Free data movement 66, 146
storage area network
restoring backup sets using 146, 318
using for LAN-Free data movement 66, 146
storage management policies 97
assigning management classes to files 68
copy groups 97
default management class 97
include-exclude list 98
management classes 97

storage management policies *(continued)*
policy domains
default 97
standard 97
policy sets
active policy set 97
subdir option 210
summary of changes for version 5.1 xvii
supported language locales 36
Swing-enabled browser
necessary to run Web client 44
symbolic links
archiving and retrieving 87
backing up and restoring 68
restoring 156
UNIX restrictions 69, 315

T

tapeprompt option 212
tasks
assigning management classes to directories 103
Authorized User 1
client scheduler, starting 48
closed registration 28
display management classes 99
GUI, override management class 103
open registration 28
password, change 48
root user 1
sessions, ending 48
setting Bourne and Korn shell environment variables 39
setting C shell environment variables 40
TCP/IP communication method
options 109
tcpbuffsize option 213
tcpclientaddress option 214
tcpclientport option 215
tcpnodelay option 216
tcpport option 217
tcpserveraddress option 218
tcpwindowsize option 219
timeformat option 220
Tivoli Storage Manager
client components
linux86 client 5
considerations when upgrading from ADSM AIX 3.1 2
password 43
todate option 265
totime option 266
transaction processing 222
summary of options 118
TSM
considerations when upgrading from ADSM AIX 3.1 11, 13
txnbytelimit option 222
type option 267

U

UNIX
file systems, ACL support 294
UNIX *(continued)*
restrictions
memory required for client processing 58
restoring symbolic links 69, 315
saving standard access permissions 87
UNIX clients
considerations when upgrading from ADSM AIX 3.1 2, 11, 13
users option 223
using
options with commands 231
using options
client 274
client command 274

V

v2archive option 268
verbose option 224
versions data
deleted attribute 100
deleted parameter 100
exists attribute 100
exists parameter 100
virtual mount point, setting 58
virtualmountpoint option 225
setting 337
virtualnodename option 227
restore/retrieve to another workstation 82
volinformation option 269

W

Web client
enable to run in a Swing-enabled browser 44
establishing communications through firewall 47, 159
managed by client acceptor 93
managed by client acceptor daemon 174
restrictions for NAS file systems 347
secure socket layer 353
specifying TCP/IP port address for 159
starting 44
summary of options 118
supported browsers 44
using through a firewall 229
webports option 229
wildcard characters
include or exclude groups of files 33
to back up groups of files 60
to include or exclude groups of files 34
using 277
using with commands 71
using with file specifications 71

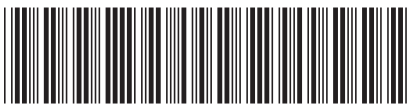
X

Xdefaults file
setting font defaults 38

Program Number: 5698-ISE
5697-ISE
5697-ISM

Printed in the United States of America
on recycled paper containing 10%
recovered post-consumer fiber.

GC32-0789-00



Spine information:

Tivoli Storage Manager for UNIX
Backup-Archive Clients Installation and User's Guide

Version 5
Release 1